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*Points in the History of the Greek, and Indo-Scythian Kings in Bactria, Cabul, and India, as illustrated by decyphering the ancient legends on their coins. By CHRISTIAN LASSEN, Bonn, 1838.*<sup>1</sup>

We now proceed to apply the fourteen letters, thus defined, to the attributive epithets, met with on the legends. From this examination we shall derive some new letters, with which the names of the kings could not furnish us, and we may perhaps succeed by this in obtaining a more exact insight into the character of the language. But let us first sum up the results of the previous inquiry.

The fourteen characters, above discussed, appear to me to be sufficiently confirmed (to aid us) in further decyphering. Twelve among them are consonants, which, however, do not enable us yet to define the system of consonants in the language. We therefore resort to the vowels. We have discovered the two simple vowels *a* and *ee*: the first, when initial in a syllable, is expressed by an independent symbol, placed in the line itself; when following a consonant, it is not expressed by an independent sign, but included in the consonant. There is no peculiar sign for the long *a*. The independent figure of *e* is not yet known to us; preceded by a consonant, it is denoted by a mark on the consonant, and it has likewise no peculiar sign, when long. It serves to express the

<sup>1</sup> Continued from p. 276. vol. ix.

Greek vowels  $\epsilon$ ,  $\eta$ ,  $\iota$ ,  $\upsilon$ , while  $\alpha$  is substituted for  $a$  and  $o$ . We are also acquainted with an  $\hat{o}$ , the long sound of the Sanscrit, compounded of  $a$  and  $u$ , which, however, when it concludes a word, loses so much of its value as to correspond with even an omicron. It is always expressed by an independent symbol in the line. We have supposed by anticipation,  $e\bar{e}$  to be of a similar nature with  $o$ ; but that  $ai$  and  $au$  exist uncontracted, is to be doubted.

With regard to the language, as we know as yet too little of it, it will be best to put together our results at the end of the next paragraph. But for the system of vowels I think it most convenient to insert here a short disquisition.

$\epsilon$ ,  $o$ ,  $\upsilon$ , not existing in the language, and the simple vowels being restricted to  $a$  and  $e$ , it may be inferred, that the language upon the coins, as regards the system of its vowels, continued to exist (from of old) in the same undisturbed and simple state. Of simple vowels, we have to expect only an  $oo$ , and it seems even probable, that, when preceded by consonants, it was written in a similar way as  $e$ .

Mr Grotefend, by reading *Ukratidó*, imagined that he had discovered the initial  $oo$  in the name Eukratides; we may subsequently dispute this view. To find the  $u$ , preceded by a consonant, we must here discuss the name, Philoxenos.

In this name the second syllable is not  $\alpha$ , as it represents  $\lambda o$  in Apollodotos; but in As. Trans. vol. iv. pl. xx1. No. 1. and No. 2. there occurs on both occasions one and the same symbol between *shinó* and the beginning of the word which has a  $\eta$ . It is but half preserved upon No. 1.; upon No. 2., however, where we do not find any appearance of decay, a  $\dagger$  occurs; thus we may fairly suppose, that  $\alpha$  belongs at this place only to  $l$ , and  $\gamma$  may be the symbol for  $u$ . R. R. II. No. 5 also is unfortunately much spoiled; yet, it is evident, that there was only one symbol between *shinó* and the beginning of the word, which can only be a well preserved  $\eta$ ; on the other hand, in No. 6. between *shinó*, and the beginning of the word, we observe the following, IH, so that we should be inclined to suppose H to be substituted for  $\alpha$ , viz. for  $\lambda o$ , and I to be K. This Mr. Grotefend has adopted. But as I shall assign to K an entirely different figure, which



cannot have occurred before  $\varnothing$ , either upon this coin, or upon the others of Philoxenos, I must maintain, that the native orthography had no K at all in the name. But supposing, the line l belonged to the preceding H, and that there must have been a  $\varnothing$  there, which in this form cannot be H, I can only admit, that the cross line was half corroded, while both final lines were too much protracted; in a word, that we must recognize here, Mr. Prinsep's figure,  $\dagger$ .

The assertion, that the second symbol in the name of Philoxenos,\* which I restore thus,  $\text{𑀧𑀭𑀮𑀳}$  is *lu*, is at variance, however, with the more common mode of representing the omicron by an inherent A. We think this objection so important, that we shall adopt  $\dagger$  for *lu* at first only in the way of conjecture. It is countenanced only by the name Agathokles, written in the old Sanscrit character, which is rendered *Agathukla*, and consequently the authority exists in at most only a contiguous language. With more confidence we maintain, that the natives did not retain the k in the name of Philoxenos, and in that case an absorption of k with the sibilant must have taken place. There is, however, no analogy with this absorption in the Prâcrit; here x ( $\text{क्ष}$ ) is altered into kkh ( $\text{क्ख}$ ); the language of the coins does not always follow the rules of absorption in Prâcrit, this is proved by *hirmajô*; it does not abound, as the Prâcrit, with reduplicated consonants; this is proved by Apollodotos, which is expressed *Apaladatô*. We must therefore look out for other analogies, and here the Zend supplies us with the very striking fact, that it often substitutes sh for  $\text{क्ष}$  (ksh) of the Sanscrit. Thus *dashina* (the right) for *daksina*, *ashi* (eye) for *akshi*. I therefore conclude  $\nabla$  to be sh (sch).

But why should this sh occur in Lysias, which has but the s in Greek? I shall be perhaps reminded, in answer, of the Sanscrit rule which might have been originally observed in the Zend, according to which s, preceded by any other vowel than a,

\* Mr. James Prinsep's last reading of this peculiar name from the Bactrian legend was as follows,  $\text{𑀧𑀭𑀮𑀳𑀧}$  *Phila-senasa* or *Philasinasa*. See page 652, vol. vii. July, 1838. It is this name and that of Lysias that proved the  $\text{𑀧}$  to be an  $\text{𑀧}$ .---H. T. P.



PAO upon the Kanerkes-coins, and he was in consequence compelled to admit some spurious forms of *n*, resembling the shape of *r* and *t*; his alphabet exhibits five of them. Mr. Prinsep supposed them to be repetitions of the word *Malakáo*. Both of them, I think, will admit the refutation on previous grounds. By the term *Mahárágó* the simple title, βασιλεὺς, is always expressed, and it is remarkable enough, that the simple word *rágan* never occurs for it. The Greeks were satisfied with the plain title βασιλεὺς; this term Menandros and the Greek Kings ordinarily make use of: Eukratides alone affects the prouder title ΒΑΣΙΛΕΩΣ ΜΕΓΑΛΟΥ, for which *Mahárágó* appears to be the adequate translation. It certainly may be so according to original meaning, but scarcely according to the real interpretation of the word; for *Mahárágó* was already so much worn out by use, that it was of no more value than the simple king. Many an insignificant chieftain thus styles himself in Indian inscriptions; and the degradation of the term has so increased, that many private men at present claim this title, as for instance Rammohun Roy, who was so called, and a *Mahárága* is as common in India, as a *principe*\* in Italy. Eukratides (whether *the second*, or not, shall here be left undiscussed) was certainly aware of the difference in the acceptation of those words, if he have also titled himself, according to the drawing of Masson (and not according to the represented coins†) upon some specimens 𐎧𐎶𐎠𐎶𐎧𐎶𐎧𐎶, “the great king, the king of kings.” As then *Mahárágó* was of less value, than it was as originally compounded, the explicit addition of the term “*great*” to Azes after the words, “*King of Kings*” is less tautological, than it appears at the first glance.

The compound word *rágárágó* corresponds to βασιλέως βασιλέων. These words (*máhárágó rágárágó*) may both be Sanscrit as well as Prâcrit; for as used here, the Sanscrit would

\* As. Trans. iv. p. 338.

† If the definition of an Italian *principe*, “something less than an English Esquire,” is correct, Mr. Lassen is certainly out in his estimate of the common usage, to which *maharaja* is put. It is only in Bengal and Behar, that the title may be termed degraded to the use of private men. 卐

change the nominative as into ô. The variety *râgâdirâgô* contains a remarkable mistake in orthography, the word *adhirâga* "Supreme King,"\* often met with in the titles of Indian Kings, has dh, not d. Whether the stamp-cutters in Azes' time, perhaps not often natives, did not pay much attention to the proprieties of indigenous grammar, or whether the language itself confounded both sounds, d and dh, I shall not pretend to decide; there will hereafter indeed occur some other examples of the same substitution.

*Mahatô* (great) compels us to declare the language of the coins a variety of Prâcrit. The Sanscrit nominative is *mahan*, the Prâcrit nominative *mahantô*; the terminal ô at this place proves also, that the alteration of as into ô occurred in all instances, as in Prâcrit. The writing *mahatô*, by exhibiting the same omission of n, as occurred in *Atimakho* for Antimachos, proves, that it is not the pure Indian Prâcrit, but a dialect, approaching also to the old Persian; for when the arrow-headed inscriptions render *gadârdâ*, hidhush† for gandârâ, hindush, there is the same exsection of n, when followed by dentals, or properly an absorption, when n is rendered like the succeeding letter; thus the Byzantines said *Kaddakootzen*, instead of *Kantakootzen*. The language of the coins, however, like the Zend, has no reduplicated consonants, consequently not *mahattô*.

The constant epithet ἀνίκητος, is very distinct upon the Philoxenos coin (As. Trans. Vol. iv. Pl. xxi. No. 1.) 𐎧𐎠𐎡𐎢𐎣, ‡ *Apalihatô*. *Apratihata* signifies in Sanscrit *non repulsus*; the preposition *prati* often becomes in Prâcrit *pali*.§ We have consequently got another Prâcrit form of quite unexceptionable interpretation. Νικηφόρος and νικάτωρ are expressed by the same word. See the coins of Amyntas (As. Trans. Vol. v.

\* Atirâg'a, being not in use for this title, I shall leave it undiscussed, if there it must not be read 𐎧𐎠 ti.

† According to Mr. Beer's correction; I have much pleasure in availing myself of this opportunity to thank him publicly for his solid and instructive, as well as kind, critique of my work on arrow-headed writing.

‡ Mr. James Prinsep reads this epithet *Apavihatasa* 𐎧𐎠𐎡𐎢𐎣, and this 𐎧𐎠𐎡𐎢𐎣 *Jayadharasa*.

§ My Grammar, iv. 5. 0.



Pl. XLVI. No. 1) and those of Archelios, at the same place (Pl. XXXV. No. 1). Farther evidence is superfluous. It is represented in the native language by  $\text{𐎧𐎥𐎧𐎡𐎢}$ . The letter, yet unknown, can be only v, and the word *gájavató* (the victorious,) according to the same form as *maható* for the Prâcrit *gajavantó*, Sanscrit *gajavan*, in the accusative, *gajavantam*.

We have therefore acquired v, ʒ. (as our 15th letter.)

The word, substituted for  $\delta\acute{\iota}\kappa\alpha\iota\omicron\varsigma$ , commences with a symbol yet unknown (As. Trans. IV. Pl. XXI. No. 9. v. pl. XXXV. No. 6. No. 1.\*) The second syllable is every where  $\Psi$ , mi; after it follows a yet undefined letter, and then ô.

The first has the form  $\epsilon$  or  $\text{Ξ}$  upon the two coins, first mentioned; upon the last coin the same sign, but reversed, so as almost to resemble ʒ; and it is probably only incorrectly drawn, though Mr. Prinsep from the Archelios coin and from one coin of Azes, who likewise assumed this title (As. Trans. IV. Pl. XXIII. No. 22. v. p. 549.) has chosen this figure for the print.† It will be safer at all events to take the other.

As I think, I have proved, that we have to look for Indian words upon the coins, it evidently follows from the second syllable that  $\text{𐎧𐎡𐎢𐎡}$  must be read, *dhamiko* (the just); in Prâcrit *dhammikó* or *dhamikó*, in Sanscrit *dharmikas*. The â is here again unwritten, and the consonant is not reduplicated according to the already stated peculiarity of the language of the coin; the union in one character of r m accords quite with the rule of Prâcrit, while the retention of the r in *Hirmajó*, is certainly to be accounted for (as before noted) by the authority of the king Hermaios, who would not allow his name to be corrupted. What I have further to prove, are the two new letters; on k, I shall speak hereafter; I will now discuss our 16th letter  $\epsilon$  or  $\text{Ξ}$ , dh.

It appeared already from former remarks, that the second n is not met with in the name Menandros. Now we know,

\* R. R. II. No. 9. is indistinct.

† The Azes-coin, however, according to the representation, is not well preserved, or not precisely copied by Mr. Masson, for the last letter also is wrong:  $\text{𐎧}$  for  $\text{𐎧}$ .

that the native language did not admit an *n*, followed by dentals. Mr. Prinsep read *Minanô*, as the penultimate symbol is indeed very similar to the *n*, already discussed. It is thus upon the coin (As. Trans. v. Pl. XLVI. No. 6,) where no error appears to have occurred  $\text{P}\xi\xi\omega$ , and I should not hesitate to read *Minanô*, were it not evident, that by the law of the language the *n* cannot be retained in Menandros, and were not the omission of *dr* at variance with the rules of the absorption of consonants.

Mr. Grotefend's supposition, as it appears from his Hebrew paraphrase  $\text{מננ} [\text{דרע}]$  is deficient, in that the termination *ô*, which he improperly puts also between brackets, occurs often enough to prove, that nothing is omitted before it. I do not therefore know, how he can read Menandrô; for the coins he used, have no more symbols than the others.

It is only fair, however, to add, that the letters of the coins (R. R. I. No. 8, 9, 11) have become so indistinct, that, with regard to the name, nothing can be decided from them. No. 10 renders, in apparently well preserved characters,  $\text{P}\text{r}\text{r}\omega$ , which we might read *Mitarô* or *Mitadô*, but the *P* upon the coin is certainly spoiled. Not to judge too arbitrarily, I shall leave it to a renewed investigation, if there occur two orthographies of that name.

By comparing the remaining copies we observe, R. R. II. No. 12. has still the *n*, though mutilated, then  $\cdot\xi$ , and lastly *P*. Even upon Tod's coin, No. 2, quoted by Mr. Grotefend, the terminal letters are also obviously  $\text{P}\xi$ ; the preceding letter is entirely misdrawn. As. Trans. Pl. XXVI. No. 2. distinctly renders  $\text{L}$  in the form, above established, and the final letters are again  $\text{P}\xi$ . Consequently  $\text{P}\xi\xi\omega$ ; No. 3 is no less distinct; the  $\cdot\xi$  has an additional point, as at R. R. II. No. 12, As. Trans. v. pl. XLVI. No. 8 has  $\text{P}\cdot\xi\xi\omega$ , with two points. At the same place, No. 1 gives  $\cdot\xi$  with the point, but afterwards an *n* of the same form, but without the point. Thus also v. pl. XLVI. No. 6.  $\text{P}\xi\xi\omega$ .\* Finally at the same place No. 9 and No. 5 have for these two  $\xi$ , two  $\text{I}$  viz.  $\text{P}\text{I}\text{I}\omega$ , save only, that No. 5 is more indistinct and corroded.

\* Mr. James Prinsep has two readings for the Bactrian legend of Menander-coins, viz.  $\text{P}\xi\xi\omega$  Menanasa and  $\text{P}\xi\text{I}\omega$  Medanasa.---H. T. P.

Here we therefore indeed observe an inconsistency in the characters, which depends not simply upon the state of the coins, while from the addition of variously situated points with both letters, we may presume, that the indistinctness was to be amended by additional diacritical symbols. This idea as to the points, cannot be established but by carefully examining the coins themselves. The point at ॠ serves perhaps to distinguish it from ॠ, r.

Be it as it may, it is evident from our review, that some coins obviously distinguish the second symbol from the third. As now ॠ by the omission of the cross line below, and by a greater curvature in the middle, may easily be altered in the figure ॡ, nothing prevents us from supposing, that the second syllable may still be ॠ or *na*.

The penultimate symbol, being proved so incontrovertibly as n, ॡ, I do not hesitate to declare it the above adopted dh ॡ. In the word *dhāmikó* we observed also instances, showing that ॡ has a straight form ॢ, and this approaches so much to n, that we can hence likewise account for the confounding of both.

For r we never meet with a peculiar symbol, and the name must therefore be read *Minadhô*. The adoption of ॡ as dh, will lastly be confirmed by the fact, that in the same word it is commonly written ॠ, and seldom ॡ. The ॠ upon the coin, R. R. I. No. 10, appears to be indeed confounded in the reversed way, viz. ॠ for ॡ. But ॡ if it be a dental sound, *dhāmikó* decides for the adoption of *dh*.

In *Minadhô* r is absorbed, according to rules of Prâcrit, for instance, *kandras* becomes *kando*. As ॡ for d appears to be the rule in Menandros, we cannot consider ॡ to be substituted by mere chance for ॠ; but it must be founded upon the nature of the language. We may here recall to mind the rule of the Zend, according to which the Sanscrit *putra* is changed into *puṭhra*. The omission of the r may have had an effect, similar with the Persian *sur*, (si, or three) which presupposes a previous form *thi*, the *th* of which still remained, after r had disappeared out of the more ancient form *thri* in Zend for the Sanscrit *tri*.

We have in *Minadhô* for Menandros an evident instance,

that the language of the coins followed its own principles, in the paraphrase of Greek names. I would notice at the same time, that we may expect a similar kind of absorption in Eukratides, and we can already hypothetically maintain, that r, preceded by consonants, was absorbed.

R before consonants is likewise absorbed, as in *dhámikó*, and we undoubtedly have properly attributed to foreign authority the deviation from the rule in *Hirmajó*. If the name Archelios were precisely represented in the native writing, it would supply us another opportunity for testing the rule for r. The name of this king is certainly written thus, and not *Archelaos*, if the Greek be properly represented, and the native legend, according to the only copy, *As. Trans. v. pl. xxxv. No. 1*, be properly rendered by Mr. Masson. The Greek legend is distinct: ΒΑΣΙΛΕΩΣ [ΔΙΚΑ]ΙΟΥ ΝΙΚΗΦΟΡΟΥ ΑΡΧΕΛΙΟΥ; the native legend is similar, save the name, which is in the copy entirely illegible. Mr. Prinsep, however, renders this also, according to Mr. Masson's drawing. I copy the whole: *ᲠἈᲓᲚᲚ ᲠᲚᲗᲗᲗ ᲠᲚᲗᲗᲗ ᲠᲗᲗᲚᲗ.*

Leaving the name for the present, we may assert, on the authority of the other examples, that the initial of the second word is incorrectly given, it must be *ε*. The legend will consequently be *Mahárágó dhamikó gajavató*, the supreme King, the just, the victorious.

In the name itself Დ is evidently an error for Ლ, *li*, as *Lishijó* for Lysias; for *rche* there consequently was only one symbol. If Mr. Masson has correctly copied, it is there *Ahalijó*. But as *ε* (epsilon) must be expressed by *e*, it follows, that the second letter has not been completely preserved, and I do not doubt, that it was *χ*, *chi*, *khi*. But there is no trace whatever of *r*, and we have again an absorption of *r* before other consonants. If Archelios was termed in the native language *Akilijó*, his pride was perhaps gratified, as being reminded of the name of the great Pelide, so that he would not much object to the rule.

The most difficult title, that namely, by which *σωτήρ* is



translated, is still left to be discussed. It too terminates in ô ; but there precede three symbols, which belong all to t, d, r, letters so easily to be confounded, though Mr. Prinsep,\* who, however, observes the ambiguity, has taken it for k. Among all the readings, *rakakô*, *radakô* *radadô*, which can be taken on his conjecture, he chooses *rakakô*, because the Sanscrit word *rakshaka* denotes *protector*, and because (he does indeed not expressly mention this, but it must have influenced his decision) its form in Prâcrit is *rakkhakô*. Though I could mention several other objections to this interpretation, suffice it to say, that there is no k to be met with in the word. For the same reason we cannot adopt the word *târaka*, supporter, deliverer.

Mr. Grotefend started on the supposition, that it was the same with KOPANO, which occurs upon the Kanerkes-coins. Besides, however, that this word may have belonged to a dialect, different from what we have hitherto discussed, the same objection will also be decisive; neither the u, here assumed, nor the k can stand the test.

After having compared all instances of this word upon the coins of Menandros, Apollodotos, Diomedes, Hermaios, it remains doubtful yet, as for what we can take the three first characters of the word; we may read  $\text{ק ר ר}$  just so, according to the coin which we choose as a criterion for those three letters.

A hint appears in the following. We observe different orthography of this word upon coins, which certainly belong to a later period, and the words on which seem to intimate an altered state of the language, as upon the coins As. Trans. Vol. iv. Pl. xxiii. No. 23, where the Greek legend exhibits  $\text{ΒΑΣΙΛΕΥΣ ΒΑΣΙΛΕΩΝ ΣΩΤΗΡ ΜΕΓΑΣ}$ , so also upon the coins of the unknown king, who usually has only Greek inscriptions;† fortunately we can easily read a portion of the native legend, it is thus:  $\text{מחאטו קרעקרטו}$ , therefore, *mahatô* — *adharô mahârâgô*; to this there probably succeeded *râgarâgô*; but this part is no longer legible.  $\epsilon$  is the second character in

\* IV. 335.

† The king too is on horseback, as upon the purely Greek coins of the great deliverer; this accords with the monogram. See at the same place No. 26. The reverse is different.

the word we are in search of; it will therefore be in the usual form a 𑀓 or d. Now the word is thus written upon the Yndopherres-coins 𑀧𑀲𑀺𑀸, dh standing here too for the first letter.

Before recognising these representatives of the first two signs\* of 𑀧𑀲𑀲𑀲, I had asked myself, by what word *σωτηρ* would be expressed in Sanscrit? The question was easily answered; it could only be *trātri*, nominative *trātā*, accusative *trātāram*; the nominative in Prâcrit is *tādârô* for this;† thus 𑀧𑀲𑀲𑀲 was without difficulty to be read. The reading, discovered afterwards, 𑀧𑀲𑀺𑀸 confirmed this interpretation. For want of a more exact knowledge, 𑀺, dh, was substituted for d. 𑀺 in the first syllable shows a state of pronunciation, still more corrupted, but otherwise it is an acceptable confirmation, by establishing the dental sound of the beginning.

In the Prâcrit of the dramas, the initial t usually retains its class (as a letter) while the t, included by other letters, is generally subdned (as a sound) to d, I find in 𑀧𑀲𑀺𑀸 this transition of t to d; without asserting, however, that this form of the d had been adopted upon the older coins. He that still adheres to the reading of *tâtârô*, can only be opposed by reasons, not to be derived from the characters. The form 𑀧𑀲𑀺𑀺 which reduces the initial also to dh, refers to a still later period of the language.

I think, I have sufficiently explained the usual epithets and titles, and I may now be allowed to survey the principal results.

The language has apparently manifested a strong bent to the Prâcrit of the dramas, by its absorptions and by forming new, short forms of A from the long ones; the nominatives in ô, as belonging also to Zend, prove nothing (as regards Prâcrit affinity) words as *râgan* and *dharmo* are so undoubtedly Indian, and not Zendic, that the relation of the language to India is quite evident from them; also *gaja* for victory, and *tādârô* for deliverer (though I shall not deny, that the latter belongs to the Zend) are entirely Indian roots.

\* Mr. James Prinsep's last reading of this word was 𑀧𑀲𑀺𑀺 *Nandatasa*.---  
H. T. P.

† My Grammar, p. 291.

But we should be wrong in not confessing, that some traces referred to a dialect, not merely Indian, as, for instance, the omission of *n* before *t* and *d*, and the want of reduplicated consonants, even when they were required for the foreign word, as *Apollodotos*. The latter fact does not accord with the *Prâcrit*, where nothing is more frequent than *ll*, *mm*, and others. The former, though not *Zendic*, is old Persian, and the language of the coins seems to occupy a place midway between the old Persian and the Indian languages.

It is now incumbent on me to vindicate the opinion I have adopted regarding *k*, in opposition to both my predecessors, in effecting which I shall discuss the names of Greek Kings, not yet examined, which will prove instrumental in fixing the alphabet.

#### § 4.

#### *Inquiry into the Alphabet from the names of Greek Kings. Continued.*

Mr. Prinsep as well as Mr. Grotefend, obtain their *k* principally from the name *Eukratides*; the latter represents it in the form  $\gamma$ ; according to the former, it does not differ from *d* and *r*. The name *Eukratides* induces the following dilemma,—whether we suppose the diphthong  $\epsilon \upsilon$  to be expressed by one or two letters, both succeeding letters are displaced. No one has supposed the case, that *r* was perhaps omitted, though it is evident, that according as it is expressed or not expressed, *k* must occupy another place. Mr. Grotefend read *Ukratidó*, Mr. Prinsep *Eukratidó*.

To arrive at the real *k*, we shall pursue a different course.

The *k* I adopted in *dhâmikó*, is exactly  $\eta$  upon the coin of Archelios; upon another at the same place, v. Pl. xxxv. No. 6,  $\gamma$  is substituted for it, so that the right half of the letter does not occur; upon the copy iv. Pl. xxi. No. 9, the symbol is destroyed, also in R. R. II. No. 9. But that  $\eta$  is the real, complete figure, follows from a remark of Mr. Prinsep\* who notices, that upon a coin of Azes (iv. Pl. xxiii. No. 22,)  $\eta$  distinctly is the penultimate symbol of the word, denoting *just*.

\* V. p. 549.





the drawings of Mr. Masson represent this wise the name  $\text{𐎧𐎡𐎴𐎠𐎹}$ . But as the k in this very name Eukratides, was entirely misunderstood formerly, I may be allowed to proceed a little more cautiously. I shall therefore place the different characters, yet preserved, of four edited coins, one under the other As. J. Vol. iv Pl. xxv. No. 8 has  $\text{𐎧𐎡𐎴𐎠𐎹}$

				9	”	$\text{𐎧𐎡𐎴𐎠𐎹}$
	”	”	”	10	”	$\text{𐎧𐎡𐎴𐎠𐎹}$
R. R. I.	”	”	”	7	”	$\text{𐎧𐎡𐎴𐎠𐎹}$

The last half consequently is *tidó*, three characters only precede it. The third among them is decidedly not r. Two legends exhibit the k, already known to us, one gives the k ( $\text{𐎧}$  for  $\text{𐎡}$ ), and a fourth decides nothing, as the legend is evidently spoiled. R is therefore omitted, as in *Minadó* for Menandros.

If therefore\*—*katidó* is to be read, Mr. Prinsep is quite right in stating, that two symbols precede k, but I do not know in this case, how he obtains his r. Mr. Grotefend proceeded carefully by adopting one character only for  $\epsilon\upsilon$  in order to get k r. He must therefore take k for r, the  $\text{𐎧}$  for k, and  $\text{𐎡}$  for a simple vowel, while the initial letter, according to him, represents u. Thus is it in his alphabet, but I hope, I have convinced him of his mistake.

In interpreting the two first characters, I shall not begin by inquiring, in what manner the diphthong  $\epsilon\upsilon$ , foreign to those languages, might have been expressed; as to its being foreign, I think, it is already inferentially proved in the previous remarks. As  $\upsilon$  is rendered by i, I shall adopt  $\text{𐎧}$  or  $\text{𐎡}$  as i, viz. as the sign of this vowel, when commencing a syllable. Though this is not here the case, yet there was no other expedient in the system of

\* Mr. James Prinsep's last reading of this name was as follows:---

Eukratidasa  $\text{𐎧𐎡𐎴𐎠𐎹}$  viz.

$\text{𐎡}$  e  
 $\text{𐎧}$  u  
 $\text{𐎡}$  kr  
 $\text{𐎡}$  ti  
 $\text{𐎧}$  d  
 $\text{𐎡}$  s

the native language, unless the writing *Ejakatidó* were chosen ; but it was more natural to write *eīkatidó*. By this paraphrase I acknowledge, that with Mr. Prinsep, I take ʾ for ê, viz. for a long ê, which was not confined to denoting the never shortened vowel of the Sanscrit, but which also expressed the lighter one of the Prâcrit, and which, as the analogous ô, ʔ, probably had its constant place in the same line with the consonants. The reason, that e in *ēikatidó* is not, as usual, expressed by i, appears even to have proceeded from the impossibility of approaching the foreign sound in any other way, than in that, above mentioned.

With regard to the last two of our three new letters, we shall call to mind, that they still have to be confirmed (17,) ʾ, k (18) ; ɔ, i ; (19,) ʾ, ê.

Again k seems to occur in a name, hitherto obscure, and which even now cannot be entirely illustrated.

The Agathokleia-coin offers the unexpected and pleasing fact of a Greek queen in that remote quarter of the East ;\* upon its one side we observe a helmeted head, whether of a woman we shall leave undecided, with the legend ; ΒΑΣΙΛΙΣΣΑΣ ΘΕΟΠΡΟΠΟ(Υ)ΑΓΑΘΟΚΛΕΙΑΣ. If we now look upon the reverse for an interpretation of the unusual and obscure epithet of the queen, we find the representation of a sitting Hercules, who appears with the left hand to hold the lion's skin, and with the right perhaps leans on a rock, as upon the coins of Euthydemus, where, however, he holds with the left the club. While in expectation of the translation of the Greek legend, we are surprized at the word ;† 𑀧𑀺𑀭𑀸𑀓𑀢𑀺 *mahārāgô*. We know the language sufficiently to assert, that it, like the Prâcrit, has not used the masculine termination for a queen. There is therefore the title of a king. Then follows 𑀧𑀺𑀭𑀸𑀓𑀢𑀺 *tādārô*, deliverer. Two testimonial instances prove, that

\* As. Trans. V. Pl. XLVI. No. 2.

† *Maharajasa* according to Mr. James Prinsep, who particularly remarks, that the masculine word is used. The word after *Maharaja* he suggests may preferably be read *Devamatasa*, which is an exact translation of ΘΕΟΤΡΟΠΟΥ.---H. T. P.

the Greek titles are not repeated on the reverse, and we therefore cannot derive any advantage from discussing them here.

After *mahârágô tádârô* we expect the name of a king, which must be contained in the symbols  $\text{P}\text{r}\text{x}\text{P}\text{h}\omega$ .\*

The writing does not compel us to divide the word in two, as Mr. Prinsep proposed, because  $\text{P}$  is placed in the middle.

The second letter, if properly drawn, can only be k, and there is no room for doubt on this point, as the coin itself was in the hands of Mr. Prinsep. The fourth character, though most closely approaching the form of dh, may likewise be taken for an n; it is accompanied by ee. Mr. Prinsep indeed substitutes for this the figure  $\text{x}$  in his print, but on the coin it is such as I represent it.

The† initials being therefore *Mikó*, may correspond with the Greek  $\text{Μικω}$ ,  $\text{Μεκω}$ ,  $\text{Μηκω}$ ,  $\text{Μυκω}$ . It appears probable, that the next letter of a Greek word is rather n than dh, which would be only substituted for d. We lastly meet with  $\text{P}$  and the unlucky letter  $\text{r}$ , which may be taken for t, d, or r, and affords a beautiful opportunity for a guess.

Since  $\text{Μεκ}$  is not the beginning of any Greek word, and no king is likely styled  $\text{Μηκωνίτης}$ , the initial letters must certainly be  $\text{Μικω}$  or  $\text{Μυκω}$ ; we cannot say much in favour of  $\text{Μικ}$ , even if we would look for an absorbed r in the native character, viz.  $\text{Μικρω}$ .

We therefore come to  $\text{Μυκω}$ , and here  $\text{Μυκώνιος}$ , from the island Mycone, appears of itself;  $\text{Μυκωνίδης}$  is indeed not a Greek name, otherwise known, though it would be least objectionable to read in this way the native characters. If  $\text{r}$  were allowed instead of  $\text{h}$ , we should obtain *Myronides*, who would be admitted with much less opposition as a king, not yet known at the Indus. But not indulging such a supposition, merely arbitrary, we do best to wait for further discoveries.

\* Mr. James Prinsep reads  $\text{P}\text{r}\text{x}\text{P}\text{h}\phi$  the name here referred to Faka-saqlitasa.---H. T. P.

† Mr. James Prinsep's discovery of the letter  $\phi$ , as equivalent to the Greek  $\phi$ , resolves the difficulty, felt by Mr. Lassen, at finding, what he read as  $\omega$  *me* at the beginning of the name of Agathocleia. In this word it is, apparently the equivalent of the Greek digamma.---H. T. P.

As the native name does not recall elements of Persian or Indian words, we shall by no means attempt to obtrude a barbarian husband on the noble Agathokleia.

### § 5.

*Continuation—regarding the names of Kings, not Greeks.*

I now pass to the coins of Kings, not Greeks, to complete the native alphabet, and to advance our knowledge of the language from their legends.

Azilises presents a new symbol. As. T. IV. pl. XXIII. No. 27. No. 28. R. R. II. No. 20.  $\gamma$ , almost like an  $\hat{e}$ ; the Greek denotes the same by an  $s$ . We have already another  $s$ ,  $\nabla$ , which we take for  $sh$ , and will discover a third  $\beth$ . We must therefore choose  $z$  or  $s$  for either of them. Besides, it is possible, that  $s$  in Azilises is substituted in the Greek translation for a  $k'$  (tseh)  $\text{च}$ , as this sound was not original in the Greek, and was adopted as  $\tau\zeta$  at a later period only. It is therefore a mere arbitrary reading, when I take conjecturally for our 20th letter  $\gamma$ , as  $z$ .

The Parthian king Vonones, has the Greek legend, ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΜΕΓΑΛΟΥ ΟΝΟΝΟΥ.\* This follows from the coins R. R. II. No. 10, No. 11, I. No. 20, where, according to the native legend, however, not ΜΕΓΑΛΟΥ, but ΔΙΚΑΙΟΥ must have been written; for we observe upon the reverse still  $\text{𐎧𐎡𐎴𐎠}$ , as also in As. J. IV. pl. XXI. No. 5. Though we do not know yet any copy, exhibiting the entire title, we can confidently construe it by comparison. The reverses also give us nothing but fragments of the native legends; we must, however, have recourse to them to obtain the name. R. R. II. No. 10 has  $\text{𐎧𐎡𐎴}$  over the right arm of Jupiter, and the letter, next following, seems to be a disfigured  $\text{𐎧}$ ; it then would be  $g\acute{o}$  the end of *Mahârágó*; for the succeeding illegible word has five characters, and is therefore  $\text{𐎧𐎡𐎴𐎠𐎧𐎡𐎴}$  *rágárágó*. It would be indeed singular, had *great* preceded the other titles. But it appears

\* The Arsakides-coins also combine both titles, as those that are attributed to the twelfth (of those kings) or Phraates III, Eckhel III, 528. ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΑΡΣΑΚΟΥ ΜΕΓΑΛΟΥ ΔΙΚΑΙΟΥ ΘΕΟΥ ΕΥΠΙΑΤΟΡΟΣ ΦΙΛΕΛΛΗΝΟΣ.



difficult to decide any thing by the instrumentality of specimens, so defective. The specimen R. R. II. No. 11, commences regularly with *mahârágô rágârágô ma(hato)*. The name does not occur on either side R. R. I. No. 20, when *mâhârágô* is scarcely to be distinguished, but evidently has over the head of Minerva  $\text{𐎧𐎡𐎴}$  ( $\epsilon$ ), *dhámikô*; then follows the name,\* As. T. IV. pl. xx1 No. 5 has  $\text{𐎧(𐎺𐎠)𐎠𐎶}$ , probably (*mahârágô ragârá*)*gô*

\* The same also upon a coin of Mr. Masson, As. T. III. pl. xi. No. 43,

1  $\text{𐎧 𐎺 𐎠 𐎶}$  𐎶

2  $\text{𐎧 𐎠 𐎶 𐎶}$  𐎶

3  $\text{𐎧 𐎶 𐎶 𐎶}$  𐎶

are read by Mr. James Prinsep, *Spalaha'rasa*, *Spalafarmasa* and *Spalirishasa*, and with reference to this part of Mr. Lassen's treatise, it may be as well to give from a letter of Mr. Lassen's to that gentleman, dated 30th December 1838, and which reached India after Mr. James Prinsep had left, never to return, the following extract, showing the opinion of Mr. Lassen, after reading the article referred to---"You will soon receive a little treatise of mine in which I have endeavoured to show amongst other things, relating to the Bactrian or Indo-Scythian part of Indian history, that the alphabet of the Bactrian-coins was only in use in Kabulistan and the Punjab, and ought therefore to be called Caboolan; my book is unfortunately written in German---I say unfortunately, because I should wish to hear your opinion on this and other views of mine. Will not M. Csoma Dekoros do me the favor to be my interpreter? Your additional corrections of the alphabet are very valuable, particularly the  $\text{𐎧}$  as s. So also your *Jayadharasa*. I suspect, that Nikatoros will turn out to be Jayavatasa, the translations being so literal, and we ought to expect two terms i. e.  $\text{𐎶}$  as different from  $\text{𐎶}$  and in my opinion  $\text{𐎶}$ . I have in my late reading attended much to the use of the different compounds of *pata*, and am persuaded, that only *apratihata* would be used for unconquered; *Apatihata* is in fact the very Prakrit form. For shortness sake, let me only state as a conjecture, that  $\sigma\omega\tau\eta\rho\omicron\varsigma$  is *tâdârasa* from  $\text{𑀘𑀓𑀭𑀺}$  on the coins of Andapherres. *Tâdârasa* or *dâdârasa* the  $\epsilon$  being  $\text{𑀓}$  also in *Minadasa*. Not to be forgotten, is your *Spalahara*, a capital reading that destroys with one blow, all our lucubrations on the data of *VONONES*. It is evident, there was a Kabulian dynasty of *Arsacidæ*, coeval with that of *Azas*. I only propose to read 𐎶 differently, as it cannot well be a compound of s and  $\text{𐎧}$ . May it not be a modification of k  $\text{𐎶}$ , corresponding with the Zend  $\text{𐬵}$ , which takes the place of  $\text{𑀓𑀓}$  in Sanscrit? Spalyrius by the Indians was called Svalyrius, which the Greek alphabet expressed by  $\omicron\iota\iota$ . The Kabulians who called the river  $\text{𑀓𑀓𑀓𑀓}$  Shushva Choaspes, pronounced the king's name Shvalyrius or Galyrius,"---H. T. P.

*maható*, as it will also have been upon R. R. II. No. 10; and then the name.

The state of these coins does not much invite inquiry after the name; but it being better preserved, than the rest of the words, we shall venture on the task.

As. Trans. IV. Pl. XXI. No. 5, has	▷ 7 2 7 3
R. R. II. No. 10 .. ...	<u>5 7 2 7 2</u>
„ „ I. „ 20 .. ...	▷ 7 2 7 7

Mr. Grotefend has read it *Vonohno*; it will be observed, the two n do not correspond, nor with the more confirmed 1, not to mention the illegitimate use of h, perhaps to render the syllable long. Mr. Prinsep, who always adheres to the more cautious principle of reading out of the characters, not into them, takes it for *ulalidó*, which reading, however, cannot be right.

On examining more closely, we find, that two authorities are against the initial 7; as many against the second P; the three last characters are identical (in the three legends); it would be therefore 7 7 7 3. The second has the greatest similarity to an l, and the whole exhibits *Valaharó* or *Valahadó*. This is indeed very different from *Vonones*, which must have been expressed by 7 1 7 1 3, if we have arranged the letters properly, and fixed the system of this alphabet.

I am persuaded, that the name cannot be the same, and as a conjecture is here quite indispensable, I shall propose the following.

The name of a Parthian king which will be first thought of, and which occurs three or four times, is *Volagases*. Upon coins, attributed to the former, or Arsakes XXIII. is the name thus written: BOAAΓΑΣΟΥ. What now if this name be written on the reverse of our coins? 7, h, rendered by g will not excite any doubt, if an h in the middle of a word is to be expressed by Greek characters. The termination alone does not agree, and here we may suppose, that by the sharp accentuation, the penultimate 7 is changed into 7. This being admitted, it would

be 𐭠𐭣𐭠𐭣𐭠𐭣, *Balahazo*, as the Indian *v* is not different in pronunciation from *b*.

This result will be surprising, and I should hesitate in communicating it, unless it appeared a very natural consequence. But how to explain the matter.

Of the Parthian language we know nothing, and he that likes, may think *Vonones* to be synonymous in the Parthian with *Valahazô*; or he may also obtain a really Indian word by writing only *Valahâsa*, viz. *he who contemns power*. I shall choose an interpretation less ingenious, but indeed based on better historical authority.

Volagases I. was the son of Vonones II. The father reigned a few months; his son, known by the wars he engaged in with Rome, is supposed to have reigned between 50 and 91 A. D.

Another Volagases is not spoken of in Parthian history as succeeding a Vonones. Have we not consequently both names upon our coins?

This conjecture appears to me so probable, that I scarcely hesitate to reject the acute one of Mr. Raoul Rochette,\* who states, that it was Vonones I., the vanquisher of Artabanus; and even though Mr. K. O. Mueller takes this explanation as undoubtedly correct, the passages of Strabo, concerning the conquests of the Parthians in Bactria, mention neither of the two Vonones.

Another king, likewise not Greek, of this later period, offers another problem. Mr. Prinsep states his name to be Ipalirisos,† and we read indeed upon the coin v. Pl. xxxv. No. 7, ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΜΕΓΑΛΟΥ ΠΠΑΙΡΙΣΟΥ; the initial *I* of the name, however, is not quite distinct. R. R. I. No. 21, gives nothing of the legend but ΒΑΣΙΛΕΩΝ ΒΑΣΙΛΕΩΣ, and upon the reverse three illegible characters. Owing to the accurate drawing of Mr. Prinsep, we can supersede that of Mr. Masson, *As. Trans.* III. Pl. XI. No. 44. Upon No. 6 the name does not occur in Greek; the rest is distinct.

Mr. Prinsep has established his reading upon the comparison

\* II. p. 28.

† *As. Trans.* V. 551.

of six well preserved copies, but the comparison is made by Mr. Masson, and he will excuse me in asserting, that the name of the king was not this; the native legend being preserved remarkably well, is thus upon both specimens of Mr. Prinsep: 𐎧𐎠𐎧𐎡𐎢𐎣𐎤𐎥𐎦𐎧𐎨𐎩𐎪𐎫𐎬𐎭𐎮𐎯𐎰𐎱𐎲𐎳𐎴𐎵𐎶𐎷𐎸𐎹𐎺𐎻𐎼𐎽𐎾𐎿𐏀𐏁𐏂𐏃𐏄𐏅𐏆𐏇𐏈𐏉𐏊𐏋𐏌𐏍𐏎𐏏𐏐𐏑𐏒𐏓𐏔𐏕𐏖𐏗𐏘𐏙𐏚𐏛𐏜𐏝𐏞𐏟𐏠𐏡𐏢𐏣𐏤𐏥𐏦𐏧𐏨𐏩𐏪𐏫𐏬𐏭𐏮𐏯𐏰𐏱𐏲𐏳𐏴𐏵𐏶𐏷𐏸𐏹𐏺𐏻𐏼𐏽𐏾𐏿𐐀𐐁𐐂𐐃𐐄𐐅𐐆𐐇𐐈𐐉𐐊𐐋𐐌𐐍𐐎𐐏𐐐𐐑𐐒𐐓𐐔𐐕𐐖𐐗𐐘𐐙𐐚𐐛𐐜𐐝𐐞𐐟𐐠𐐡𐐢𐐣𐐤𐐥𐐦𐐧𐐨𐐩𐐪𐐫𐐬𐐭𐐮𐐯𐐰𐐱𐐲𐐳𐐴𐐵𐐶𐐷𐐸𐐹𐐺𐐻𐐼𐐽𐐾𐐿𐑀𐑁𐑂𐑃𐑄𐑅𐑆𐑇𐑈𐑉𐑊𐑋𐑌𐑍𐑎𐑏𐑐𐑑𐑒𐑓𐑔𐑕𐑖𐑗𐑘𐑙𐑚𐑛𐑜𐑝𐑞𐑟𐑠𐑡𐑢𐑣𐑤𐑥𐑦𐑧𐑨𐑩𐑪𐑫𐑬𐑭𐑮𐑯𐑰𐑱𐑲𐑳𐑴𐑵𐑶𐑷𐑸𐑹𐑺𐑻𐑼𐑽𐑾𐑿𐒀𐒁𐒂𐒃𐒄𐒅𐒆𐒇𐒈𐒉𐒊𐒋𐒌𐒍𐒎𐒏𐒐𐒑𐒒𐒓𐒔𐒕𐒖𐒗𐒘𐒙𐒚𐒛𐒜𐒝𐒞𐒟𐒠𐒡𐒢𐒣𐒤𐒥𐒦𐒧𐒨𐒩𐒪𐒫𐒬𐒭𐒮𐒯𐒰𐒱𐒲𐒳𐒴𐒵𐒶𐒷𐒸𐒹𐒺𐒻𐒼𐒽𐒾𐒿𐓀𐓁𐓂𐓃𐓄𐓅𐓆𐓇𐓈𐓉𐓊𐓋𐓌𐓍𐓎𐓏𐓐𐓑𐓒𐓓𐓔𐓕𐓖𐓗𐓘𐓙𐓚𐓛𐓜𐓝𐓞𐓟𐓠𐓡𐓢𐓣𐓤𐓥𐓦𐓧𐓨𐓩𐓪𐓫𐓬𐓭𐓮𐓯𐓰𐓱𐓲𐓳𐓴𐓵𐓶𐓷𐓸𐓹𐓺𐓻𐓼𐓽𐓾𐓿𐔀𐔁𐔂𐔃𐔄𐔅𐔆𐔇𐔈𐔉𐔊𐔋𐔌𐔍𐔎𐔏𐔐𐔑𐔒𐔓𐔔𐔕𐔖𐔗𐔘𐔙𐔚𐔛𐔜𐔝𐔞𐔟𐔠𐔡𐔢𐔣𐔤𐔥𐔦𐔧𐔨𐔩𐔪𐔫𐔬𐔭𐔮𐔯𐔰𐔱𐔲𐔳𐔴𐔵𐔶𐔷𐔸𐔹𐔺𐔻𐔼𐔽𐔾𐔿𐕀𐕁𐕂𐕃𐕄𐕅𐕆𐕇𐕈𐕉𐕊𐕋𐕌𐕍𐕎𐕏𐕐𐕑𐕒𐕓𐕔𐕕𐕖𐕗𐕘𐕙𐕚𐕛𐕜𐕝𐕞𐕟𐕠𐕡𐕢𐕣𐕤𐕥𐕦𐕧𐕨𐕩𐕪𐕫𐕬𐕭𐕮𐕯𐕰𐕱𐕲𐕳𐕴𐕵𐕶𐕷𐕸𐕹𐕺𐕻𐕼𐕽𐕾𐕿𐖀𐖁𐖂𐖃𐖄𐖅𐖆𐖇𐖈𐖉𐖊𐖋𐖌𐖍𐖎𐖏𐖐𐖑𐖒𐖓𐖔𐖕𐖖𐖗𐖘𐖙𐖚𐖛𐖜𐖝𐖞𐖟𐖠𐖡𐖢𐖣𐖤𐖥𐖦𐖧𐖨𐖩𐖪𐖫𐖬𐖭𐖮𐖯𐖰𐖱𐖲𐖳𐖴𐖵𐖶𐖷𐖸𐖹𐖺𐖻𐖼𐖽𐖾𐖿𐗀𐗁𐗂𐗃𐗄𐗅𐗆𐗇𐗈𐗉𐗊𐗋𐗌𐗍𐗎𐗏𐗐𐗑𐗒𐗓𐗔𐗕𐗖𐗗𐗘𐗙𐗚𐗛𐗜𐗝𐗞𐗟𐗠𐗡𐗢𐗣𐗤𐗥𐗦𐗧𐗨𐗩𐗪𐗫𐗬𐗭𐗮𐗯𐗰𐗱𐗲𐗳𐗴𐗵𐗶𐗷𐗸𐗹𐗺𐗻𐗼𐗽𐗾𐗿𐘀𐘁𐘂𐘃𐘄𐘅𐘆𐘇𐘈𐘉𐘊𐘋𐘌𐘍𐘎𐘏𐘐𐘑𐘒𐘓𐘔𐘕𐘖𐘗𐘘𐘙𐘚𐘛𐘜𐘝𐘞𐘟𐘠𐘡𐘢𐘣𐘤𐘥𐘦𐘧𐘨𐘩𐘪𐘫𐘬𐘭𐘮𐘯𐘰𐘱𐘲𐘳𐘴𐘵𐘶𐘷𐘸𐘹𐘺𐘻𐘼𐘽𐘾𐘿𐙀𐙁𐙂𐙃𐙄𐙅𐙆𐙇𐙈𐙉𐙊𐙋𐙌𐙍𐙎𐙏𐙐𐙑𐙒𐙓𐙔𐙕𐙖𐙗𐙘𐙙𐙚𐙛𐙜𐙝𐙞𐙟𐙠𐙡𐙢𐙣𐙤𐙥𐙦𐙧𐙨𐙩𐙪𐙫𐙬𐙭𐙮𐙯𐙰𐙱𐙲𐙳𐙴𐙵𐙶𐙷𐙸𐙹𐙺𐙻𐙼𐙽𐙾𐙿𐚀𐚁𐚂𐚃𐚄𐚅𐚆𐚇𐚈𐚉𐚊𐚋𐚌𐚍𐚎𐚏𐚐𐚑𐚒𐚓𐚔𐚕𐚖𐚗𐚘𐚙𐚚𐚛𐚜𐚝𐚞𐚟𐚠𐚡𐚢𐚣𐚤𐚥𐚦𐚧𐚨𐚩𐚪𐚫𐚬𐚭𐚮𐚯𐚰𐚱𐚲𐚳𐚴𐚵𐚶𐚷𐚸𐚹𐚺𐚻𐚼𐚽𐚾𐚿𐛀𐛁𐛂𐛃𐛄𐛅𐛆𐛇𐛈𐛉𐛊𐛋𐛌𐛍𐛎𐛏𐛐𐛑𐛒𐛓𐛔𐛕𐛖𐛗𐛘𐛙𐛚𐛛𐛜𐛝𐛞𐛟𐛠𐛡𐛢𐛣𐛤𐛥𐛦𐛧𐛨𐛩𐛪𐛫𐛬𐛭𐛮𐛯𐛰𐛱𐛲𐛳𐛴𐛵𐛶𐛷𐛸𐛹𐛺𐛻𐛼𐛽𐛾𐛿𐜀𐜁𐜂𐜃𐜄𐜅𐜆𐜇𐜈𐜉𐜊𐜋𐜌𐜍𐜎𐜏𐜐𐜑𐜒𐜓𐜔𐜕𐜖𐜗𐜘𐜙𐜚𐜛𐜜𐜝𐜞𐜟𐜠𐜡𐜢𐜣𐜤𐜥𐜦𐜧𐜨𐜩𐜪𐜫𐜬𐜭𐜮𐜯𐜰𐜱𐜲𐜳𐜴𐜵𐜶𐜷𐜸𐜹𐜺𐜻𐜼𐜽𐜾𐜿𐝀𐝁𐝂𐝃𐝄𐝅𐝆𐝇𐝈𐝉𐝊𐝋𐝌𐝍𐝎𐝏𐝐𐝑𐝒𐝓𐝔𐝕𐝖𐝗𐝘𐝙𐝚𐝛𐝜𐝝𐝞𐝟𐝠𐝡𐝢𐝣𐝤𐝥𐝦𐝧𐝨𐝩𐝪𐝫𐝬𐝭𐝮𐝯𐝰𐝱𐝲𐝳𐝴𐝵𐝶𐝷𐝸𐝹𐝺𐝻𐝼𐝽𐝾𐝿𐞀𐞁𐞂𐞃𐞄𐞅𐞆𐞇𐞈𐞉𐞊𐞋𐞌𐞍𐞎𐞏𐞐𐞑𐞒𐞓𐞔𐞕𐞖𐞗𐞘𐞙𐞚𐞛𐞜𐞝𐞞𐞟𐞠𐞡𐞢𐞣𐞤𐞥𐞦𐞧𐞨𐞩𐞪𐞫𐞬𐞭𐞮𐞯𐞰𐞱𐞲𐞳𐞴𐞵𐞶𐞷𐞸𐞹𐞺𐞻𐞼𐞽𐞾𐞿𐟀𐟁𐟂𐟃𐟄𐟅𐟆𐟇𐟈𐟉𐟊𐟋𐟌𐟍𐟎𐟏𐟐𐟑𐟒𐟓𐟔𐟕𐟖𐟗𐟘𐟙𐟚𐟛𐟜𐟝𐟞𐟟𐟠𐟡𐟢𐟣𐟤𐟥𐟦𐟧𐟨𐟩𐟪𐟫𐟬𐟭𐟮𐟯𐟰𐟱𐟲𐟳𐟴𐟵𐟶𐟷𐟸𐟹𐟺𐟻𐟼𐟽𐟾𐟿𐠀𐠁𐠂𐠃𐠄𐠅𐠆𐠇𐠈𐠉𐠊𐠋𐠌𐠍𐠎𐠏𐠐𐠑𐠒𐠓𐠔𐠕𐠖𐠗𐠘𐠙𐠚𐠛𐠜𐠝𐠞𐠟𐠠𐠡𐠢𐠣𐠤𐠥𐠦𐠧𐠨𐠩𐠪𐠫𐠬𐠭𐠮𐠯𐠰𐠱𐠲𐠳𐠴𐠵𐠶𐠷𐠸𐠹𐠺𐠻𐠼𐠽𐠾𐠿𐡀𐡁𐡂𐡃𐡄𐡅𐡆𐡇𐡈𐡉𐡊𐡋𐡌𐡍𐡎𐡏𐡐𐡑𐡒𐡓𐡔𐡕𐡖𐡗𐡘𐡙𐡚𐡛𐡜𐡝𐡞𐡟𐡠𐡡𐡢𐡣𐡤𐡥𐡦𐡧𐡨𐡩𐡪𐡫𐡬𐡭𐡮𐡯𐡰𐡱𐡲𐡳𐡴𐡵𐡶𐡷𐡸𐡹𐡺𐡻𐡼𐡽𐡾𐡿𐢀𐢁𐢂𐢃𐢄𐢅𐢆𐢇𐢈𐢉𐢊𐢋𐢌𐢍𐢎𐢏𐢐𐢑𐢒𐢓𐢔𐢕𐢖𐢗𐢘𐢙𐢚𐢛𐢜𐢝𐢞𐢟𐢠𐢡𐢢𐢣𐢤𐢥𐢦𐢧𐢨𐢩𐢪𐢫𐢬𐢭𐢮𐢯𐢰𐢱𐢲𐢳𐢴𐢵𐢶𐢷𐢸𐢹𐢺𐢻𐢼𐢽𐢾𐢿𐣀𐣁𐣂𐣃𐣄𐣅𐣆𐣇𐣈𐣉𐣊𐣋𐣌𐣍𐣎𐣏𐣐𐣑𐣒𐣓𐣔𐣕𐣖𐣗𐣘𐣙𐣚𐣛𐣜𐣝𐣞𐣟𐣠𐣡𐣢𐣣𐣤𐣥𐣦𐣧𐣨𐣩𐣪𐣫𐣬𐣭𐣮𐣯𐣰𐣱𐣲𐣳𐣴𐣵𐣶𐣷𐣸𐣹𐣺𐣻𐣼𐣽𐣾𐣿𐤀𐤁𐤂𐤃𐤄𐤅𐤆𐤇𐤈𐤉𐤊𐤋𐤌𐤍𐤎𐤏𐤐𐤑𐤒𐤓𐤔𐤕𐤖𐤗𐤘𐤙𐤚𐤛𐤜𐤝𐤞𐤟𐤠𐤡𐤢𐤣𐤤𐤥𐤦𐤧𐤨𐤩𐤪𐤫𐤬𐤭𐤮𐤯𐤰𐤱𐤲𐤳𐤴𐤵𐤶𐤷𐤸𐤹𐤺𐤻𐤼𐤽𐤾𐤿𐥀𐥁𐥂𐥃𐥄𐥅𐥆𐥇𐥈𐥉𐥊𐥋𐥌𐥍𐥎𐥏𐥐𐥑𐥒𐥓𐥔𐥕𐥖𐥗𐥘𐥙𐥚𐥛𐥜𐥝𐥞𐥟𐥠𐥡𐥢𐥣𐥤𐥥𐥦𐥧𐥨𐥩𐥪𐥫𐥬𐥭𐥮𐥯𐥰𐥱𐥲𐥳𐥴𐥵𐥶𐥷𐥸𐥹𐥺𐥻𐥼𐥽𐥾𐥿𐦀𐦁𐦂𐦃𐦄𐦅𐦆𐦇𐦈𐦉𐦊𐦋𐦌𐦍𐦎𐦏𐦐𐦑𐦒𐦓𐦔𐦕𐦖𐦗𐦘𐦙𐦚𐦛𐦜𐦝𐦞𐦟𐦠𐦡𐦢𐦣𐦤𐦥𐦦𐦧𐦨𐦩𐦪𐦫𐦬𐦭𐦮𐦯𐦰𐦱𐦲𐦳𐦴𐦵𐦶𐦷𐦸𐦹𐦺𐦻𐦼𐦽𐦾𐦿𐧀𐧁𐧂𐧃𐧄𐧅𐧆𐧇𐧈𐧉𐧊𐧋𐧌𐧍𐧎𐧏𐧐𐧑𐧒𐧓𐧔𐧕𐧖𐧗𐧘𐧙𐧚𐧛𐧜𐧝𐧞𐧟𐧠𐧡𐧢𐧣𐧤𐧥𐧦𐧧𐧨𐧩𐧪𐧫𐧬𐧭𐧮𐧯𐧰𐧱𐧲𐧳𐧴𐧵𐧶𐧷𐧸𐧹𐧺𐧻𐧼𐧽𐧾𐧿𐨀𐨁𐨂𐨃𐨄𐨅𐨆𐨇𐨈𐨉𐨊𐨋𐨌𐨍𐨎𐨏𐨐𐨑𐨒𐨓𐨔𐨕𐨖𐨗𐨘𐨙𐨚𐨛𐨜𐨝𐨞𐨟𐨠𐨡𐨢𐨣𐨤𐨥𐨦𐨧𐨨𐨩𐨪𐨫𐨬𐨭𐨮𐨯𐨰𐨱𐨲𐨳𐨴𐨵𐨶𐨷𐨹𐨺𐨸𐨻𐨼𐨽𐨾𐨿𐩀𐩁𐩂𐩃𐩄𐩅𐩆𐩇𐩈𐩉𐩊𐩋𐩌𐩍𐩎𐩏𐩐𐩑𐩒𐩓𐩔𐩕𐩖𐩗𐩘𐩙𐩚𐩛𐩜𐩝𐩞𐩟𐩠𐩡𐩢𐩣𐩤𐩥𐩦𐩧𐩨𐩩𐩪𐩫𐩬𐩭𐩮𐩯𐩰𐩱𐩲𐩳𐩴𐩵𐩶𐩷𐩸𐩹𐩺𐩻𐩼𐩽𐩾𐩿𐪀𐪁𐪂𐪃𐪄𐪅𐪆𐪇𐪈𐪉𐪊𐪋𐪌𐪍𐪎𐪏𐪐𐪑𐪒𐪓𐪔𐪕𐪖𐪗𐪘𐪙𐪚𐪛𐪜𐪝𐪞𐪟𐪠𐪡𐪢𐪣𐪤𐪥𐪦𐪧𐪨𐪩𐪪𐪫𐪬𐪭𐪮𐪯𐪰𐪱𐪲𐪳𐪴𐪵𐪶𐪷𐪸𐪹𐪺𐪻𐪼𐪽𐪾𐪿𐫀𐫁𐫂𐫃𐫄𐫅𐫆𐫇𐫈𐫉𐫊𐫋𐫌𐫍𐫎𐫏𐫐𐫑𐫒𐫓𐫔𐫕𐫖𐫗𐫘𐫙𐫚𐫛𐫜𐫝𐫞𐫟𐫠𐫡𐫢𐫣𐫤𐫦𐫥𐫧𐫨𐫩𐫪𐫫𐫬𐫭𐫮𐫯𐫰𐫱𐫲𐫳𐫴𐫵𐫶𐫷𐫸𐫹𐫺𐫻𐫼𐫽𐫾𐫿𐬀𐬁𐬂𐬃𐬄𐬅𐬆𐬇𐬈𐬉𐬊𐬋𐬌𐬍𐬎𐬏𐬐𐬑𐬒𐬓𐬔𐬕𐬖𐬗𐬘𐬙𐬚𐬛𐬜𐬝𐬞𐬟𐬠𐬡𐬢𐬣𐬤𐬥𐬦𐬧𐬨𐬩𐬪𐬫𐬬𐬭𐬮𐬯𐬰𐬱𐬲𐬳𐬴𐬵𐬶𐬷𐬸𐬹𐬺𐬻𐬼𐬽𐬾𐬿𐭀𐭁𐭂𐭃𐭄𐭅𐭆𐭇𐭈𐭉𐭊𐭋𐭌𐭍𐭎𐭏𐭐𐭑𐭒𐭓𐭔𐭕𐭖𐭗𐭘𐭙𐭚𐭛𐭜𐭝𐭞𐭟𐭠𐭡𐭢𐭣𐭤𐭥𐭦𐭧𐭨𐭩𐭪𐭫𐭬𐭭𐭮𐭯𐭰𐭱𐭲𐭳𐭴𐭵𐭶𐭷𐭸𐭹𐭺𐭻𐭼𐭽𐭾𐭿𐮀𐮁𐮂𐮃𐮄𐮅𐮆𐮇𐮈𐮉𐮊𐮋𐮌𐮍𐮎𐮏𐮐𐮑𐮒𐮓𐮔𐮕𐮖𐮗𐮘𐮙𐮚𐮛𐮜𐮝𐮞𐮟𐮠𐮡𐮢𐮣𐮤𐮥𐮦𐮧𐮨𐮩𐮪𐮫𐮬𐮭𐮮𐮯𐮰𐮱𐮲𐮳𐮴𐮵𐮶𐮷𐮸𐮹𐮺𐮻𐮼𐮽𐮾𐮿𐯀𐯁𐯂𐯃𐯄𐯅𐯆𐯇𐯈𐯉𐯊𐯋𐯌𐯍𐯎𐯏𐯐𐯑𐯒𐯓𐯔𐯕𐯖𐯗𐯘𐯙𐯚𐯛𐯜𐯝𐯞𐯟𐯠𐯡𐯢𐯣𐯤𐯥𐯦𐯧𐯨𐯩𐯪𐯫𐯬𐯭𐯮𐯯𐯰𐯱𐯲𐯳𐯴𐯵𐯶𐯷𐯸𐯹𐯺𐯻𐯼𐯽𐯾𐯿𐰀𐰁𐰂𐰃𐰄𐰅𐰆𐰇𐰈𐰉𐰊𐰋𐰌𐰍𐰎𐰏𐰐𐰑𐰒𐰓𐰔𐰕𐰖𐰗𐰘𐰙𐰚𐰛𐰜𐰝𐰞𐰟𐰠𐰡𐰢𐰣𐰤𐰥𐰦𐰧𐰨𐰩𐰪𐰫𐰬𐰭𐰮𐰯𐰰𐰱𐰲𐰳𐰴𐰵𐰶𐰷𐰸𐰹𐰺𐰻𐰼𐰽𐰾𐰿𐱀𐱁𐱂𐱃𐱄𐱅𐱆𐱇𐱈𐱉𐱊𐱋𐱌𐱍𐱎𐱏𐱐𐱑𐱒𐱓𐱔𐱕𐱖𐱗𐱘𐱙𐱚𐱛𐱜𐱝𐱞𐱟𐱠𐱡𐱢𐱣𐱤𐱥𐱦𐱧𐱨𐱩𐱪𐱫𐱬𐱭𐱮𐱯𐱰𐱱𐱲𐱳𐱴𐱵𐱶𐱷𐱸𐱹𐱺𐱻𐱼𐱽𐱾𐱿𐲀𐲁𐲂𐲃𐲄𐲅𐲆𐲇𐲈𐲉𐲊𐲋𐲌𐲍𐲎𐲏𐲐𐲑𐲒𐲓𐲔𐲕𐲖𐲗𐲘𐲙𐲚𐲛𐲜𐲝𐲞𐲟𐲠𐲡𐲢𐲣𐲤𐲥𐲦𐲧𐲨𐲩𐲪𐲫𐲬𐲭𐲮𐲯𐲰𐲱𐲲𐲳𐲴𐲵𐲶𐲷𐲸𐲹𐲺𐲻𐲼𐲽𐲾𐲿𐳀𐳁𐳂𐳃𐳄𐳅𐳆𐳇𐳈𐳉𐳊𐳋𐳌𐳍𐳎𐳏𐳐𐳑𐳒𐳓𐳔𐳕𐳖𐳗𐳘𐳙𐳚𐳛𐳜𐳝𐳞𐳟𐳠𐳡𐳢𐳣𐳤𐳥𐳦𐳧𐳨𐳩𐳪𐳫𐳬𐳭𐳮𐳯𐳰𐳱𐳲𐳳𐳴𐳵𐳶𐳷𐳸𐳹𐳺𐳻𐳼𐳽𐳾𐳿𐴀𐴁𐴂𐴃𐴄𐴅𐴆𐴇𐴈𐴉𐴊𐴋𐴌𐴍𐴎𐴏𐴐𐴑𐴒𐴓𐴔𐴕𐴖𐴗𐴘𐴙𐴚𐴛𐴜𐴝𐴞𐴟𐴠𐴡𐴢𐴣𐴤𐴥𐴦𐴧𐴨𐴩𐴪𐴫𐴬𐴭𐴮𐴯𐴰𐴱𐴲𐴳𐴴𐴵𐴶𐴷𐴸𐴹𐴺𐴻𐴼𐴽𐴾𐴿𐵀𐵁𐵂𐵃𐵄𐵅𐵆𐵇𐵈𐵉𐵊𐵋𐵌𐵍𐵎𐵏𐵐𐵑𐵒𐵓𐵔𐵕𐵖𐵗𐵘𐵙𐵚𐵛𐵜𐵝𐵞𐵟𐵠𐵡𐵢𐵣𐵤𐵥𐵦𐵧𐵨𐵩𐵪𐵫𐵬𐵭𐵮𐵯𐵰𐵱𐵲𐵳𐵴𐵵𐵶𐵷𐵸𐵹𐵺𐵻𐵼𐵽𐵾𐵿𐶀𐶁𐶂𐶃𐶄𐶅𐶆𐶇𐶈𐶉𐶊𐶋𐶌𐶍𐶎𐶏𐶐𐶑𐶒𐶓𐶔𐶕𐶖𐶗𐶘𐶙𐶚𐶛𐶜𐶝𐶞𐶟𐶠𐶡𐶢𐶣𐶤𐶥𐶦𐶧𐶨𐶩𐶪𐶫𐶬𐶭𐶮𐶯𐶰𐶱𐶲𐶳𐶴𐶵𐶶𐶷𐶸𐶹𐶺𐶻𐶼𐶽𐶾𐶿𐷀𐷁𐷂𐷃𐷄𐷅𐷆𐷇𐷈𐷉𐷊𐷋𐷌𐷍𐷎𐷏𐷐𐷑𐷒𐷓𐷔𐷕𐷖𐷗𐷘𐷙𐷚𐷛𐷜𐷝𐷞𐷟𐷠𐷡𐷢𐷣𐷤𐷥𐷦𐷧𐷨𐷩𐷪𐷫𐷬𐷭𐷮𐷯𐷰𐷱𐷲𐷳𐷴𐷵𐷶𐷷𐷸𐷹𐷺𐷻𐷼𐷽𐷾𐷿𐸀𐸁𐸂𐸃𐸄𐸅𐸆𐸇𐸈𐸉𐸊𐸋𐸌𐸍𐸎𐸏𐸐𐸑𐸒𐸓𐸔𐸕𐸖𐸗𐸘𐸙𐸚𐸛𐸜𐸝𐸞𐸟𐸠𐸡𐸢𐸣𐸤𐸥𐸦𐸧𐸨𐸩𐸪𐸫𐸬𐸭𐸮𐸯𐸰𐸱𐸲𐸳𐸴𐸵𐸶𐸷𐸸𐸹𐸺𐸻𐸼𐸽𐸾𐸿𐹀𐹁𐹂𐹃𐹄𐹅𐹆𐹇𐹈𐹉𐹊𐹋𐹌𐹍𐹎𐹏𐹐𐹑𐹒𐹓𐹔𐹕𐹖𐹗𐹘𐹙𐹚𐹛𐹜𐹝𐹞𐹟𐹠𐹡𐹢𐹣𐹤𐹥𐹦𐹧𐹨𐹩𐹪𐹫𐹬𐹭𐹮𐹯𐹰𐹱𐹲𐹳𐹴𐹵𐹶𐹷𐹸𐹹𐹺𐹻𐹼𐹽𐹾𐹿𐺀𐺁𐺂𐺃𐺄𐺅𐺆𐺇𐺈𐺉𐺊𐺋𐺌𐺍𐺎𐺏𐺐𐺑𐺒𐺓𐺔𐺕𐺖𐺗𐺘𐺙𐺚𐺛𐺜𐺝𐺞𐺟𐺠𐺡𐺢𐺣𐺤𐺥𐺦𐺧𐺨𐺩𐺪𐺫𐺬𐺭𐺮𐺯𐺰𐺱𐺲𐺳𐺴𐺵𐺶𐺷𐺸𐺹𐺺𐺻𐺼𐺽𐺾𐺿𐻀𐻁𐻂𐻃𐻄𐻅𐻆𐻇𐻈𐻉𐻊𐻋𐻌𐻍𐻎𐻏𐻐𐻑𐻒𐻓𐻔𐻕𐻖𐻗𐻘𐻙𐻚𐻛𐻜𐻝𐻞𐻟𐻠𐻡𐻢𐻣𐻤𐻥𐻦𐻧𐻨𐻩𐻪𐻫𐻬𐻭𐻮𐻯𐻰𐻱𐻲𐻳𐻴𐻵𐻶𐻷𐻸𐻹𐻺𐻻𐻼𐻽𐻾𐻿𐼀𐼁𐼂𐼃𐼄𐼅𐼆𐼇𐼈𐼉𐼊𐼋𐼌𐼍𐼎𐼏𐼐𐼑𐼒𐼓𐼔𐼕𐼖𐼗𐼘𐼙𐼚𐼛𐼜𐼝𐼞𐼟𐼠𐼡𐼢𐼣𐼤𐼥𐼦𐼧𐼨𐼩𐼪𐼫𐼬𐼭𐼮𐼯𐼰𐼱𐼲𐼳𐼴𐼵𐼶𐼷𐼸𐼹𐼺𐼻𐼼𐼽𐼾𐼿𐽀𐽁𐽂𐽃𐽄𐽅𐽆𐽇𐽋𐽍𐽎𐽏𐽐𐽈𐽉𐽊𐽌𐽑𐽒𐽓𐽔𐽕𐽖𐽗𐽘𐽙𐽚𐽛𐽜𐽝𐽞𐽟𐽠𐽡𐽢𐽣𐽤𐽥𐽦𐽧𐽨𐽩𐽪𐽫𐽬𐽭𐽮𐽯𐽰𐽱𐽲𐽳𐽴𐽵𐽶𐽷𐽸𐽹𐽺𐽻𐽼𐽽𐽾𐽿𐾀𐾁𐾃𐾂



Now we know, that the languages of Iran do not admit the Indian compound *sv*, for which they adopt another, more agreeable to the laws of their sounds. The junction of consonants, originally substituted for *sv*, is *hv*, as also *h* is used for a simple *s*. This *hv*, hardened in Zend, becomes *kv* or *q*, which simple sound is substituted for the Indian compound *sv*. The old Persian language, less hard in sound, softens the above mentioned *hv* in such a way, as to lose the *h* in *u*, so nearly related to *v*; the junction of characters, which corresponds in the arrow-headed writing to the Zend 𐬨, properly denotes therefore *uv*.\* This alteration is foreign to the Indian Prâcrit.

According to my opinion, the *k* in the name, above mentioned, represents, as the Zendic *q* does, the compound *sv*, which is included in the Greek letters  $\sigma\pi$ . *Sva* might be expressed in Greek by  $\sigma\upsilon\alpha$ . But by supposing, that *v* was more hardly pronounced, (as for example the *çv* of Sanscrit indeed becomes *çp* in Zend), we shall not find the orthography  $\sigma\pi$  for *sv* very strange. And I shall not insist even upon maintaining, that those kings were called *Svalyrios* and *Svalirisos*; but I use only *sv* to explain, how *k* (equivalent to) 𐬨 may represent *sp*; This *k* is the third Iranian transformation of *hv*, in the process of which *h* becomes hard, as in Zend, but entirely drops the sound *v*, consequently *sv* in Sanscrit, *hv*, or *q* in Zend, *uv* in ancient Persian, *k* in the language of the coins, not yet geographically defined, (as to the countries in which it prevailed.)

But why then a double kind of pronunciation upon the same coin? If the name of the king was *Kalirisos* in the native language, why was it not the same in Greek? and how could it be written *Spalirisus* in Greek, if it in fact did not sound thus in the language of the country? A third view is still possible, which appears to settle the difficulty. The king, not being a native, was probably called *Spalirisus* or *Sualirisos* in his own language, but not in the language of the country, whose inhabitants were under his sway. They changed the name into *Kalirisos*, according to the system of their sounds, while the coin-stampers, knowing the Greek language, had no reason to call him otherwise than he did himself.

\* The old Persian arrow-headed inscriptions, p. 107.



of the foregoing king, the mark of the vowel e is so often omitted, that we need not scruple at supplying ¢, as a vestige of it is almost extant upon one coin. But if the first two syllables are *kali*, the third must be ʎ. For this the only distinct specimen has a character which we may take for r, to the head of whose angle a small circle is annexed. But then follows a sign which we may read as t, d, or r, and hence we are not allowed to take the preceding sign as r. The same ø, however, denotes a Greek v upon the latest coins of this class. The most probable conjecture therefore would be to supply e with regard to the fourth character, and so far it would be read, *kalyri*. But now, according to the precedent of the previous names, there must follow ʔΛ, jô, viz. *Kalyrijô*, instead of which we meet with a character which is merely to be read as an m. The fact, however, that ʔ follows υ, is of main importance, as this being the case, the word is complete.

According to the specimens lying before me, this ʔ is not certain, and the entire reading is therefore left problematical.

*Mô* does by no means compensate for the expected jô; on the other hand the Greek writing in no sort authorises us to read OY instead of MOY. I cannot unravel this difficulty. Mr. Prinsep presumed, the word which I take for the name, to be the translation of *brother*, and supposed, that the word *king* was at the end of the legend. Against this supposition I have to raise the decisive objection, that the name cannot be expressed by the first word, and that, on the contrary, we can point it out on the most plausible conjecture in the third word. This being the case, the construction differs from the Greek,\* and the *brother of the king*, or what corresponds to this word, occupies the first place; the legend, as far as I have observed, never commences upon these coins from below, in consequence, we have not to look for another word, preceding the first. Nevertheless it is possible, that the third word was followed by a title for *Spalyrios*, though there is left no room for a legend below, if the coins are exactly represented.

The first word seems to have been so well and congruously

\* Mr. James Prinsep reads the Bactrian legend of the coins of Undopherras ʔʎʎʎʔʎʎʐ *Farahetasa Nandatasa*, which seems a preferable reading to this of Mr. Lassen.---H. T. P.

preserved, as not to admit any alteration of the letters. We dare only speculate, as to whether it have six or seven characters, and as room is left for the first (?) according to my previous remark, we may presume, that Mr. Masson was mistaken with reference to this letter. The word is therefore  $\pi \gamma \eta \gamma \lambda \gamma$ . This, however, is a complete mystery to me; neither do I know a word, which denotes *brother* or relation of any degree, bearing the least similarity to this, nor can I derive a proper signification from those syllables, though the end (*paró? pādó?*) exhibits a common Indian word. I must therefore leave this word to an inquirer who is more fortunate in guessing, or more acute in discerning.

Another barbarian king was named *Ynadpherrres\** or *Yndopherrest†* (Undopherres) and styled himself βασιλέως σωτήρος or βασιλεύς σωτήρ; for the Greek legend gradually exhibits the nominative, which the native language used from the beginning, As. Trans. Vol. iv. Pl. xxiv. No. 5—8. The legends, which are much spoiled, supply each other's deficiencies as follow; I remark, that the name is to be read from within the inside, and not in the manner in which we usually read coins, by keeping the image on them in its natural position; this will be easily evident, if the letters are looked at in the usual way—

No.	5	gives	$\pi f \gamma \gamma \phi$	$\pi \chi \gamma \lambda \psi$	----
„	6	„	----	$\pi \chi \gamma \lambda \psi$	$\pi$
„	7	„	$\pi f$ ----	----	$\lambda \psi$
„	8	„	$\pi f \gamma \gamma \phi$		

\* Mr. James Prinsep explains this, by discovering the word *Pūtasa* after *Balahara* or *Svalahara*, and the difficulty does appear to be removed by this reading, which is quite reconcilable with the idiom of the language.—H. T. P.

† There is only one letter preceding N, namely Y. Mr. Mionnet reads likewise  $\Upsilon \text{ΝΑΔΦΕΡΡΟΥ}$ , and adds a *Sic?* Description de médailles antiques supplément, Tome viii. p. 506. I only got this work, while printing my book. I am sorry to add, that the reading of the native legends is not only not advanced by the representations there exhibited, but the legends, which we may read without difficulty in the representations of them, given by Messrs. Raoul-Rochette and Prinsep, are perverted in an indistinct web of confused strokes. The false classification might be passed over, as it would not cause great impediment to inquiry, but I have taken sufficient pains with this work, to dare to assert, that to try to decipher anything with certainty from those copies would be labour in vain.



I have already before discussed the orthography of *dhádhâró*, here it differs only in that it is placed before the word *king*.

By comparing the four specimens, we observe, that the name consists only of five native characters, and also that it ends in ô. The first letter  $\varphi$  of the word cannot be but a vowel in its initial form, and according to the course of the language, in other instances, we should have to adopt an e for v. As, however, the letter  $\beth$  in the name Eukratides was fixed for this, the sense of both letters becomes doubtful; for  $\varphi$  being e,  $\beth$  would be u, and *vice versâ*. I would rather adopt y for  $\varphi$ , keeping the signification e for  $\beth$ ; for we found above  $\varphi$  must be a vowel, which we know cannot be e, as e is never written in the line, while in the Greek the equivalent was v. The symbol  $\varphi$  often occurs in the legends of Manikyâla, and is certainly genuine. No. 22.

Between y and ô there are merely three letters for the three consonants d-ph-r, commencing the syllables, which we ought to admit, if the name was *Yndopherres*; in this case the n, preceding d, is dropped according to the rule. Also the second symbol is a real d upon one specimen; upon the second is a character, which appears indeed to be corrupt, but a corruption rather of n than d. If *Ynadpherres* be considered as the name, though the language of the coins would absorb d into ph, yet it would not express by any legible mark the d, so absorbed. We are here also left in the dark; but as d is much more certain than n, I shall at once decide in favour of d. Therefore yda stands for the first half. Then follows  $\varphi$ ;  $\epsilon$  being expressed by e, we must consider it as denoting phi; but we above found p for  $\phi$  in Philoxenos, and shall do the same in Kadphises. The tolerably distinct coin of Kadphises has, however, (As. Trans. Vol. iv. Pl. xxxviii. No. 3, as with Tod. Pl. xii. No. 10,) the form  $\pi$  for pi; here the little cross line is perhaps meant to give the force to p as f. Our  $\varphi$  is entirely different from it; what might be taken for the mark of a vowel, is no e, and could at the most be u; this will not advance us a step further. On the other hand  $\varphi$  has a great similarity with the initial letter of Eukratides, and as ê is probably written in the line, according to the analogy of ô, we might read here



In the name itself the copy erroneously gives  $\pi$  for the  $\phi$  of the coins, consequently pi, or phi. We know already  $\pi$  as denoting s; the next letter, however, is not a distinct  $\rho$  upon any coin, it is rather like t, and as I have above mentioned, it might here be read *tá dháró*. We might presume, that *Kadphis*

ገደጦቻችሁ ኢየሱስምን ቅዱስ ሥፍራዎችን

“Of the great sovereign, the king of kings, both here and every where  
seizing the earth, &c. Mokadphises the saviour.---H. T. P.

was to be read without any flexion, as other coins exhibit *Kαδαφες*. The less reason is there then to connect *mo*, which has no flexion, with Kadphises. It is evident, that much is here left to be explained, but chiefly the word which has been proved superfluous, whether it be in the middle or on the end. We shall likewise mention the two symbols *ῥ* and *ῑ*, No. 23 and 24, as wanting confirmation.

The most ancient coins, on which appear the characters hitherto discussed, come down to about the year 180—160. B. C. The kings Yndopherres and Kadphises probably reigned in the first century A. C. A variety of the same characters, more like italic characters, but not essentially differing, is met with among relics in Manikyâla, where are discovered likewise coins of the Sassanides; traces of these characters are even to be observed upon the coins of the Sassanides themselves; we can therefore assign to this alphabet a period from the year 160 B. C. at least to the year 226. A. C., a period therefore of four hundred years. From Menandros and Eukratides to Yndopherres this difference alone is remarkable, that the characters of the native alphabet continue to be well formed and regular, while the Greek deteriorate more and more to a barbarian level. The italic letters out of the topes probably exhibit, rather the running hand in daily use, while the characters upon the coins represent the monumental form.

This remark may serve to introduce a variety of the writing upon the coins, of a peculiar spiral form, which we have no reason for assigning to a later period than to that of Kadphises, and which would therefore appear to be a provincial deviation from it.

### § 6.

#### *Variety of the characters of coins upon some coins of Hermaios.*

I here bring together another class of coins, not yet very numerous, which, like the preceding, present upon the one side Greek, upon the other side native legends in a peculiar form of the alphabet, to which, however, Mr. Prinsep has already drawn our attention. As. Trans. iv. p. 347. Besides the Greek has become much more rough, and we do not know, if we meet with barbarian words, or with Greek ones in the dis-



figuration, effected by barbarian ignorance ; the native characters appear at the first glance quite foreign to us.

We will first compare two coins, *As. Trans.* Vol. v. Pl. xxxv. No. 12, and Vol. iv. Pl. xxiv. No. 11. The one has the Greek legend, ΚΑΔΦΙΖΟ ΧΟΡΓ --- ΚΟΖΟΥΛΟ, and supplies the other, where we find, ΚΑΔΦΙCΕC ----- ΝΟ, as it seems for, ΚΑΔΦΙΣΕΣ ΚΟΖΟΥΛΟΧΟΡΑΝΟ ; for here is Ο generally a square, and C for Σ.

The native legend has :

𑀓𑀲𑀭𑀮 - - - - 𑀅𑀲𑀓𑀲𑀮𑀲𑀓  
𑀓𑀲𑀮𑀲𑀭𑀮 - - - - 𑀅𑀲𑀓𑀲𑀮𑀲𑀓

iv. Pl. xxiv. No. 13 is not certain.

We are astonished at recognising in the first two signs after the cross, which recurs often upon these coins, and scarcely has the value of a letter, the last letters in the foregoing Kadphises legend, represented according to Mr. Prinsep. We may read them *nara (man)*. The letters, subsequent to this, are evidently in the common character of the coins 𑀅𑀲𑀓, save, that here a round tail is substituted for the small cross line below, as the characters are generally altered from an angular to a rounder form. We find consequently *Kagala*, or if we read according to the Greek, the inherent *a* by *o*, as it is now also read in Bengalee, *Kogolo*, we have therefore here the un-Grecian word, which already occurred in the Greek writing.

If we turn to the last word, the initial letter of it is *y*, the two last syllables are *vama* or *vomo*. Though we might take the second letter for 𑀲, according to one coin, yet the others, belonging to this class, have always a character similar to 𑀲, and the word consequently is *yhovomo*, which obviously is the word *ονημο* upon the coins of Kadphises ; 𑀲 therefore is *u*, and we accordingly must infer, that the name in the foregoing legends had existed in the unoccupied space (of the legend).

Let us place these coins in comparison with all those, the relics of whose Greek legends are as follows : *As. Trans.* Vol. iv. Pl. xxiv. No. 9, 10, 12, v. Pl. xxxv. No. 10, - - ΛΕΩΣ ΣΤΗΡΟΣΣΥΛΑ□ - ΒΑΣΙΛΕ - - - - ΕΡΜ - ΒΑΣΙΛΕΩΣ - - - Ε□Υ, - and ΒΑΣΙΛΕΩΣ ΣΤΗΡΟΣΣΥ ΕΡΜΑΙΟΥ.

We have here an entirely foreign word ΣΤΗΡΟΣ. If this,



conjecture, entirely ungrounded, as we cannot at all explain the following; not even the name of Hermaios is to be discovered, and we should probably find extant the name of his Scythian conqueror, together with what corresponds to the strange, ΣΥ.

Notwithstanding this obscurity, we may, however, derive some isolated facts from these coins; first, that the language is here no longer Indian. Thus *Uhavima* and *Kagala* do not admit of a natural and appropriate interpretation as Indian words. Both of them perhaps belonged to the Scythian language, and it appears cannot be explained, but with reference to the context. KOPANO agrees with the Indian dialect upon the Kanerkes-coins, which have PAO in place of the former Râjô; we cannot therefore allow of *Κοίρανος*. Nor can it denote *king* or *prince*, used as it is in immediate connection with PAO, *king*. Therefore upon the Kadphises-coins, where XOPANO appears in juxta-position with KOZOYΛO, the title of *king*, must be looked for, being probably KOZOYΛO, *king*. As these Hermaios-coins have the word βασιλέως, and give στῆρος as a Greek word, viz. for σωτήρ, we must expect to meet with an equivalent for *deliverer* upon them; the plausible inference suggests itself, that *Uhavima* upon the reverse may be the Scythian word for σωτήρ.

To this interpretation it may be objected, that *Uhavima*, being the same with Οσημο in the great Kadphises legends, is observed to follow σωτήρ, and that consequently it cannot be the same term, but rather some native epithet of the Kadphises.

To this division belongs a third variety of Kadphises-coins, upon which ΖΑΘΟΥ is substituted for KOZOYΛO; this also is a term for *king*, probably not of Scythian origin; for it occurs As. Trans. Vol. v. Plate xxxv. p. 553: XOPANOY ΖΑΘΟΥ ΚΑΔΑΦΕΣ.

I shall not undertake reading the native legend from the edited specimen, especially as Mr. Prinsep has promised to put together some other coins of this class.

KOPANOY and ΖΑΘΟΥ are declined as Greek words, unless OY be not taken for a varied orthography of O: the barbarian name *Kadaphes*, on the other hand, is not declined.

*Zaθov* calls to mind as well the Sanscrit *Kshattr* (man of the military caste) as *Khshathra*, the Zend word for *king*; the *r* in this case would have been absorbed on account of the softer dialect, while *z* was used for *khsh* (X) or rather for a softer pronunciation, perhaps *sh* as in *Pilushino* for Philoxenos. This interpretation being ascertained, we make the attempt at explaining also in the same dialects the word KOPANO, or XOPANO. *Kirana* (ray quasi, radiant) finally adopted by Mr. Prinsep, is not at all satisfactory, any more than *Karana* (to do) but *Karana* also denotes man of impure caste, son of an impure Kshatrija couple, or according to the opinion of others, son of a Vaishcha by a Soodra woman, whose occupation is the profession of a writer. By this interpretation we should have got two titles from Indian castes. But I am prevented from acceding to it by the fact, that XOPANO occurs with ZAΘOY, and that the combination of the different titles of this class of coins leads to σωτήρ, as representing the word KOPANO; for the title *deliverer* is adhered to with such predilection by those Scythians, that we may ordinarily expect this meaning, and as ZAΘOY for *king* probably refers to a dialect, nearer related to Zend, I would rather look for an interpretation to that language. Here, however, it appears, it is not to be discovered; for though *qarena* is a word in Zend, the signification (*brilliant*) is not a proper one. The following, however, also speaks in favour of Zend. By the title KOPANO a tie is formed between the Kanerkes-coins, and those of the family of Kadphises, for both of them are thus styled. But then the other words upon the Kanerkes-coins refer to a dialect, which indeed also contains reference to India, but at the same time points at certain elements, more congenial to Iran.

While this class of coins, partly by the name *Hermaios*, partly by the title σωτήρ, and by the combination of Greek and native legends, is linked together with the expiration of Greek dominion, it is also connected by the word KOPANO with the class of Kanerki coins of partly Scythian origin, the words of which, though not of the Greek language, are always written in Greek characters. The terms *Zaθov* and *Koζουλο*



as well as the form of characters, somewhat altered, are peculiar to it, whilst other coins with the name *Kadphises* present the characters, previously used. The real *Kadphises* coins have all symbols of worship of Siva, and the word *οονμο*, *Uhavima*, the *Karano-Kadaphes*, a Hercules.

To comprehend all the palæographic and philological facts, referring to our investigation, we must, before entering upon the attempt at applying these coins to history, at least touch on some other relics of this writing.

### § 7.

#### *The legends in the Topes.*

In the digging of the *Topes*, (*stoopas*), which are so frequently discovered throughout the whole region, governed by the Indo-Scythian kings, and which were most probably destined for their ashes, some inscriptions are found in the same characters we have hitherto discussed, in a more running hand, however, and difficult to be read with accuracy. They are published by Mr. Prinsep, and I may refer to his accounts of them.\* These inscriptions being important in more than one respect to our investigations, we should have made the attempt at their interpretation, if we could have done it, without departing too much from the subject, peculiar to this work.

But this departure would have been necessary, for the writing is more indistinct than that upon the coins, especially so the characters of the inscription, most ample and apparently most important. Though engaging therefore in tedious grammatical discussions, yet many things must have been left partly without any explanation, and partly under a mere doubtful interpretation, and from the decyphering, but partially successful, no profitable conclusion would have resulted, as respects the historical arrangement of the Indo-Scythian kings. Lastly, it would also have been necessary to have entered upon a consideration of the end, for which these remarkable architectural monuments themselves were constructed, and to have examined the views, which a celebrated German scholar has pronounced concerning them. The *topes*

\* *As. Trans.* III. Pl. XXI. and Pl. XXXIII. It must be attributed to the inexperience of these characters at that time, that the inscriptions are reversed.

are much better adapted to a separate treatise, which may be published in time.

Here we shall merely call in question the view under which these monuments are deemed Buddhist. Buddhistic coins, exhibiting on the obverse the old Indian characters which occur on the columns of Asoka, and on the reverse those characters we are here illustrating, have been indeed discovered in India, but never in the topes. Hence appears it very surprising, that Buddhist kings should have had buried with them, various coins of the Romans, of the Sassanides, of the worshippers of Mithra, and even such as allude to the worship of Shiva and Vishnoo, excluding entirely (their own or) Buddhist coins.

We shall take from these inscriptions only what is confirmed beyond doubt. They first prove, that the native characters, adopted upon the coins by the Græco-Indian kings, out of regard to their subjects, were not only retained under the government of the first Indo-Scythian, but also continued to the period of the Sassanides; for in the topes Sassanian coins, furnished with Pehlvi, and Deva Nagaree legends, are discovered among the coins of Kadphises, and Kanerki. The characters of our coins therefore were still in use under the Sassanides, even after the time when the Kanerkes dynasty had abolished the use of the characters upon the coins in their empire.

The inscriptions, moreover, bear witness to the writing being used for other purposes than for inscriptions on coins; probably, however, by kings only of foreign descent, and who reigned on the borders of India. On this hereafter.

Lastly, with regard to the language; as the termination ô frequently recurs, and the word *Mahârâjô*\* was discovered by Mr. Prinsep in the larger inscription of Manikyâla, evidence is afforded, that we fall in here also with the Indian language; the inscription at Jellalabad contains purely Indian words in Prâcrit.

Upon monuments of a later period than that of the Sassanides, no traces of the characters upon our coins have yet appeared.

\* As Trans. III. pl. xxxiii. second line, iv. p. 336.

## § 8.

*Coins of Agathokles and Pantaleon.*

We may now turn to another class of coins, those namely of the kings, above mentioned. The coins of both of them have genuine Greek characters, and those of Agathokles must be numbered with the most beautiful coins, which have been preserved, and belong to the most flourishing period of Greek art in Bactria, and the countries adjacent. Both kings hold to the simple title βασιλέως, but have besides upon the reverse of some coins, legends in the most ancient shape of Indian characters, of the very same shape which is discovered in Prâcrit upon the laths, thus styled, or columns with Buddhistic inscriptions in Prâcrit.

The merit of having decyphered these most ancient Indian characters, is also due to Mr. Prinsep, and I have here only to give an account of the manner he has applied them to these coins.\*

The Agathokles coins (R. R. I. No. 1, As. Trans. III. Pl. IX. No. 17. v. Pl. xxxv. No. 9) present the following signs :

𑀘𑀓𑀭𑀺𑀲𑀺𑀓 The penultimate alone is indistinct; Mr. Prinsep presumes it to be 𑀲, therefore *Agathuklajég*, which he takes for the Greek genitive Ἀγαθοκλεους; I should rather prefer 𑀲, or *jog*. Still it appears strange to meet here with a Greek rather than a native form for the Greek. That the Greek  $\varsigma$  should be expressed by 𑀲, or *j* may be explained by suggesting, that the final  $\varsigma$  was received as a media (sound) like the *z* in Zend, to which *j* would be the most appropriate Indian letter. These coins had another word over the female Bacchanal, of which no undisputed characters have been preserved; it is perhaps, as Mr. Prinsep supposes, a fragment of *râja*.

In the name we observe also a mode of representing vowels purely Indian, viz. *a*, not expressed by a sign, and *u*, annexed below to the consonant, as also the ligature *ke*, which is completely Indian.

Of Pantaleon have only been discovered coins with legends, likewise in the same Sanscrit characters, As. Trans. vol v. Pl. xxxv. No. 8, III. Pl. IX. No. 18, excepting the first letter, the name

\* As. Trans. vi. p. 465.

is preserved : 𑀧𑀭𑀢𑀺𑀭 Pantalavanta ; the termination is wanting, and what Mr. Prinsep has supplied for it, tâ, appears to me unsatisfactory. Here, as with Agathokles, the hiatus in εου and εο is amended by the insertions of a semivowel, in the latter *j*, and here *v*, as above, in the names *Dijamidô*, *Lisijô*. Besides, the use of the Anusvâra must be noticed, as representative of nasal sound. Upon the Pantaleon-coins, moreover, are only illegible fragments of the title ; but two of these symbols lead to *râja*, preceded by something else, which perhaps formed originally *mahârâjô*, “ the supreme king.” To the historical illustration of these coins, the only ones upon which Greek and purely Indian characters are put together, we shall afterwards return.

### § 9.

#### *The Kanerkes Coins.*

Lastly, come we to a very numerous class of Indo-Scythian coins, having only Greek characters, which seldom represent Greek words, but ordinarily give in Greek letters, either un-Grecian regal titles, or names of gods. They are of very different types ; on the obverse, either a standing male figure in the dress of a Tartar, or a bust only ; or else one mounted on an elephant ; or, lastly, a figure, resting on a couch, with the legs crossed one over the other, after the fashion of the East, the head surrounded by a glory. The legend sometimes ΒΑΣΙΛΕΥΣ, sometimes ΒΑΣΙΛΕΥΣ ΒΑΣΙΛΕΩΝΚΑΝΕΡΚΟΥ, or ΡΑΟ ΝΑΝΟ ΡΑΟ ΚΑΝΗΡΚΙ ΚΟΡΑΝΟ or ΡΑΟ-ΚΑΝΗΡΚΙ, upon those with the bust ΡΑΟΝΑΝΟ ΡΑΟ ΟΗΡΚΙ (ΟΟΗΡΚΙ or ΧΙ) ΚΟΡΑΝΟ ; upon the others the same titles, with an illegible name. The reverses have various figures of gods, together with their names in Greek characters, but seldom in the Greek language, but commonly in a native one.

This result, which I have taken from Mr. Prinsep's laborious investigations, may suffice for the present purpose ; I also refer to him for the fact, (As. Trans. iv. p. 630) that the coins never present legends in native characters.

I call the king *Kanerki*, because he so styles himself, when he assumes native titles. The form *Κανηρκου* appears to have ari-



sen from the mere misunderstanding of the Scythian die-founders. Observing upon the former coins ordinarily the Greek genitive in *ου*, on the reverse in the native language the nominative in *ô*, which did not sound very differently, they overlooked the different application. *Κανηρκου* therefore appeared to them the proper form, to be placed by the Greek titles, even when the use of the nominative was then adopted for the Greek legend. Thus is *Κανηρκου* put by *βασιλεὺς*, though *Kanerko* could be only properly used, when accompanied by *Mahârâjo*.

I have already previously professed my ignorance concerning KOPANO ; it is singular, that *σωτήρ*, according to our conjecture, corresponding to that word, never occurs, to my knowledge, with the word *βασιλεὺς* upon these coins.

*Rao Nano Rao* is certainly properly explained by Mr. Prinsep to be the same with *βασιλεὺς βασιλέων* ; I add the following remarks on the forms. *Rao* (viz. *raô*) points to a dialectic difference, a step more distant from the original form, than is the form *rajô* of the other coins ; for in the first place the consonant *j* is dropped, a proceeding indeed often resorted to in the learned Prâcrit ; but whenever *râa* and *râjâ* are found together in the ordinary spoken language, the difference in form, refers to a difference in dialect. To the historic grammarian *raâ* is a later form than *râja* ; however, it need have therefore arisen at a later period ; for one dialect may have anticipated the rest in the reduction of the old forms ; we may, or may not, therefore, refer dialectically *rao* to another province. Again, the declination of *rao* is not as the simple word *râjan* would require it should be, according to Sanscrit rule ; but, on the other hand, the compound word *maharajah* is most properly brought under the declination in *a* ; but as we do not know any instance of the simple word *râjan*, the parallel has no application.

*Rao Nano* can merely be the genitive plural. In Prâcrit it would be *rannam*, or after the declination in *a* *râ(j)â nam*. Instead of this, *Nano* seems to be the termination upon the coins in question, and this termination is not joined to *râa*, as to the root of the word, but to the nominative *rao*, and the *m* of the termination is changed into *no*. If I take a right view of the form *raonano*, it belongs to the period of transition, when from the

first degree of the decomposition of grammatical structure of the Sanscrit, evidence of which is exhibited to us in Prâcrit, the language was about to retrograde another step; thus, not distinctly comprehending the sense of the old form, the language then in use could no longer distinguish the peculiar form of the root from that of the termination.

The name *Kanerki* has been compared with *Kanishka*, which occurs in the chronicle of Caschmir, and in the traditions of the Buddhists. I would not scruple at the *r*, as supplied by *sh*, and if the comparison of them was well founded, I would even proceed a step further, and find in *Οηρκι* the same *Hushka*, who is mentioned with *Kanishka*. On the supposition, that *Οηρκι* might stand for *Huirki*, and *sh* substituted for *r*, we could easily fancy *Huishka* to be altered into *Hushka*. But besides the difficulties in chronology, which I have not to enter upon at present, another reason from the coins themselves is opposed to our recognizing *Hushka* and *Kanishka* in *Οηρκι* and *Κανηρκι*. Both of them are described as Buddhist; upon the coins of these latter, however, a worship, entirely deviating from that of the Buddhists, is distinctly obvious.

For these coins present on their reverse figures of gods, as to which, on a reference to the various religious systems, prevailing for the first centuries of our era in central Asia, we fortunately can be but rarely in doubt. The names occur with them, and in part quite legible. I may here refer to the explanation, most successfully given by K. O. Mueller,\* on the system of gods, represented upon the Kanerki-coins. According to him, it is a system of typified gods, originating in the pure worship of Zoroaster's doctrine of light, which readily adopted the elements of the worship of Nature, prevailing in Asia Minor at that period, while it at the same time communicated to all the objects of worship, so adopted, the general stamp of *gods of light*.

\* Goett. Gel. Anz. 1838, 237, p. 233.

(*To be continued.*)

*Note on the Lepchas of Sikkim. By A. CAMPBELL, Esq. Superintendent of Dorjeling.*

When I had the honor some months ago of forwarding a few Notes on the Mech tribe,\* I ventured to announce my expectation of being able to furnish some particulars of other tribes inhabiting the neighbouring countries of eastern Nipal, Sikkim, and Bootan. To this end, I had collected and recorded some useful memoranda regarding the Lepchas, Bhotiahs, Limboos, Murnis, Gurungs, and Hains, all mountaineers, which by an unfortunate accident were destroyed by fire; nevertheless, as the establishment of this Sanatarium for our countrymen affords them opportunities of communicating with classes of men which have hitherto been denied to all except the few who under very restrictive circumstances have sojourned in Nipal, I am induced to forward some particulars of the Lepchas, with an alphabet and very meagre vocabulary of their language, in the hope that they may be of some assistance to persons visiting this place, who may have leisure and a disposition to acquire the means of colloquial and written intercourse in their own language, with a most interesting people, and I believe the undoubted aborigines of the mountain forests surrounding Dorjeling.

Although the Lepchas have a written language, it has not been ascertained that they now have, or ever did possess any recorded history of themselves, or chronicles of any important events in which they have taken part. The "Lepchas," so called by us, and indeed by themselves in conversation with strangers, are divided into two races, viz. "Rong" and "Khámábá." Rong in colloquial intercourse among them is a generic term, and equivalent to "Lepcha" with us. But a man who announces himself a Lepcha to an European, Nipalese, or Hindoostani, may, on being questioned, turn out to be a Khámábá. The real Lepcha, or Rong proper, has no tradition whatever, so far as I can learn, connected with the advent of his tribe into this part of the world. Here he has always been, to the best of his knowledge and belief, and this is corroborated by all his neighbours. The habitant of the Lepchas occupies an extreme

\* Vide As. Soc. Journ. No. 92.

extent of about 120 miles from north-west to south-east, along the southern face of the Himalaya; to the west, the Tambar branch of the Koori bounds it; but on the east its limits are undefined in the mountains of Bootan. Thus they are found among the subjects of eastern Nipal, throughout the whole of Sikkim, and extending an unknown distance into Bootan. I believe however that they are found in very small numbers indeed further east than fifty miles beyond the Teestah, although a few of them are said to be located as far east as Punnuka, and Tassgong.\*

The Khámbá although now the same in all essentials of language, customs, and habits, as the Rong, is professedly, and undoubtedly, an emigrant from beyond the Himalaya. They state themselves to have come from a province of China, called Khám, which is described as lying to the east and north of Lhassa, about thirty days' journey. This province has not been very long annexed to the Chinese empire, and if the accounts I have heard from members of the Nipalese Missions to Peking are to be relied on, its rulers and inhabitants are even now far from being well governed and peaceable subjects of the celestial dynasty. They are represented as a herd of lawless thieves and robbers, through whose country it is scarce safe to travel, even when under the protection of an escort from the Court of Peking.

The Khámbás reckon seven generations since their arrival on this side the snows, which may be computed at 200 years. They were headed by the first ancestor of the present Sikkim Raja, who is himself a Khámbá. Previous to the arrival of the Khámbás, it is said that great confusion existed among the Lepcha and Bhotia aborigines of Sikkim, in consequence of the incessant struggles for supremacy between their chiefs; they however had priests (Lamas) from Paling Goombah, beyond the snows, whose advice was often followed in temporal matters, and when it appeared to these learned leaders that it was hopeless to quiet dissensions by ordinary means, they suggested that a Raja should be sought for in some distant

\* Towns in Bootan; see Pemberton's report.



country, to whom all classes should tender allegiance. This was agreed to, and a deputation of Lamas proceeded into Thibet Pote-leang, in search of a fitting ruler for Sikkim; here they were unsuccessful, and passed on to Kham-leang,\* where, after much trouble, they discovered a boy, the son of respectable parents, whose horoscope was considered auspicious; he was offered the Sikkim crown, it was accepted, and attended by his Khámbá clansmen was brought from beyond the snows, and proclaimed Raja of Dinjong (Lepcha for the Sikkim country).

The first Raja although chosen for the office in a similar manner to that adopted in the election of fresh incarnations of deceased Lamas, did not exercise any spiritual authority over his people; the Lamas who brought him to the throne retained this in their own hands for some time, but not long after the spiritual power came into the family of the Raja, where it still continues. At present, the eldest son of the Raja is a Lama and high priest of the kingdom, a younger son being nominated heir apparent to the throne.

The Khámbás although a Trans-Himalayan tribe, and hence by us generally denominated Bhotiahs, or Thibetans, consider themselves included in that generic appellation; but the following distinctions are made by the Lepchas in talking of people who are called Bhotiahs by Europeans—the Bhotiah from beyond the snows is “Pote,” and his country “Pote-leang;” he of Sikkim “Arratt,” and his country “Dinjong;” and he of Bootan is denominated “Proh-murroh,” or man of Proh.

The Lepchas, Khámbás, and Lepchas proper, to be understood as included under this term, are Bhuddhists, following the priests of Thibet and those of their own tribe indiscriminately; the former from being generally educated at religious establishments of repute, are considered the more orthodox, the latter rarely go beyond the snows to study, when they do, they derive the full advantages of the superior consideration accorded to the Thibetans, provided they adhere to the strict rules of monachism. Marriage is permitted to the native Lepcha priest,

\* “Leang,” country or province.

and he is counted as a good match for the daughters of the chiefs. The influence of the priests is considerable, but it is far short of that attained by those of Bootan over the Bhotiahs, as described by Captain Pemberton, and the majority of them are obliged, and not ashamed, to relinquish a dependence on alms for the more active employments of agriculture and trade.

Restrictions of Hindooism as to caste are not admitted by the Lepchas, although those who live under the Nipal government are obliged to conform to the Hindoo laws of that state, this however they do with a very bad grace, and rarely forego an opportunity of crossing into Sikkim, or coming to Dorjeling, to indulge their beef-eating propensities. They are gross feeders, eating all kinds of animal food, including the elephant, rhinoceros, and monkey, and all grains and vegetables known to us, with the addition of many roots and plants altogether excluded from our culinary list. Pork is their most favourite flesh, next to that, beef, goat, mutton. The yák is considered the best beef, next to that the flesh of the Sikkim cow (a fine animal) and last, the Bengalli and common cow. All birds are included in their list of eatable game; of the carrion of wild animals that of the elephant is most prized. The favourite vegetable food is rice, next to it wheat, barley, maize, millet, murwa, and a fine species of yam called "bookh," which grows all over these mountains, at elevations of from 1500 to 3000 feet. During the rains when grain is scarce they contentedly put up with ferns, bamboo roots, several sorts of fungi, and innumerable succulent plants found wild on the mountains. Fond of fermented and spirituous liquors, they are nevertheless not given to drunkenness; their common drink is a kind of beer made from the fermented infusion of Indian corn and murwa, which is weak, but agreeably acid, and very refreshing. This is drunk at all times when procurable, and when making a journey it is carried in a large bamboo chungá, and diligently applied to throughout the day. They have no distilled liquor of their own, but they greatly admire and prize all our strong waters, our port and sherry, cherry brandy, and maraschino. Tea is a favourite beverage, the black sort brought from China in large cakes being that preferred; it is prepared by boiling, after which the decoction

is churned up in a chungu with butter and salt; milk is never taken with tea.

Their cooking is careless, coarse, and not cleanly. Rice is generally boiled, when travelling, in pieces of the large bamboo, at home in coarse iron pots. Vegetables are always boiled, in oil, when the latter is procurable, and spiced with capsicum and ginger, of which these hills possess very fine kinds. Salt is not a commonly used condiment, the chief source of supply until lately being Thibet, whence rock salt is brought on men's backs; the easier communication with the plains of Bengal by the new Dorjeling road admits of the importation of this article at a cheaper rate, and sea salt is rapidly taking the place of the other.

The Lepcha dress is simple, handsome, and graceful. It consists of a robe of striped red and white cotton cloth crossed over the breast and shoulders, and descending to the calf of the leg, leaving the arms bare; a loose jacket of red cotton cloth is worn over the robe by those who can afford it, and both are bound round the waist by a red girdle; some strings of coloured beads round the neck, silver and coral earrings, a bamboo bow and quiver of iron-pointed arrows, and a long knife, complete the dress of the men. The knife, called *Bán* by the Lepchas, and *Chipsá* by the Bhotiahs, is constantly worn by the males of all ages and ranks; it hangs on the right side, suspended from the left shoulder, and is used for all purposes. With the *Bán* the Lepcha clears a space in the forest for his house and cultivation; it is the only tool used by him in building; with it he skins the animals who fall a prey to his snares and arrows, it is his sword in battle, his table knife, his hoe, spade, and nail parer. Without the *Bán* he is helpless to move in the jungles; with it, he is a man of all work; no wonder then that the expertness with which it is used by the boys of a few years old even, should be the astonishment of strangers.

The women are less handsomely dressed than the men; a piece of plain unbleached cotton cloth, or the cloth of the castor oil insect, rolled round to form a sort of petticoat, with a loose bedgown of the same, and a profusion of mock

coral and coloured bead necklaces, form their entire wardrobe. They are the domestic and farm drudges of the men, performing all out- and in-door work along with their husbands, and much besides. It is not unusual to meet a stout and active man bow in hand, sauntering along the road followed by his wife and sisters heavily loaded with grain or merchandise. It is the delight of a Lepcha to be idle, he abhors the labour of practising any craft, but he expects that while he is amused and unemployed, the female part of the household shall be busily engaged in the field, or in looking after the pigs and poultry.

Marriages among the Lepchas are not contracted in childhood, as among the Hindoos, nor do the men generally marry young. This arises mainly from the difficulty of procuring means of paying the parents of the bride the expected *douceur* on giving the suitor his daughter to wife; this sum varies from 40 rupees to 400, or 500, according to the rank of the parties. It is not customary to allow the bride to leave her parents' home for that of her husband until the sum agreed on has been paid in full; hence, as the consummation of the marriage is permitted while the female is still under her father's roof, it is by no means uncommon to find the husband the temporary bondsman of his father-in-law, who exacts, Jewish fashion, labour from his son, in lieu of money, until he shall have fairly won his bride.

The women are not strictly bound to chastity previous to marriage, although any injury to the matrimonial bed is punished by beating and divorce. Children born out of wedlock belong to the mother.

The Lepchas intermarry with the Limboos and Bhotiahs, and the offspring of such unions become members of the father's tribe, without any disqualification whatever.

The Lepchas, like true Buddhists, bury their dead, although the Murmis, a Buddhist tribe and inhabiting the same country, burn their corpses first, and afterwards bury the ashes. The presence of death in a hamlet is always regarded with temporary horror, and the house he has visited is almost always forsaken by the surviving inmates; fevers and small-pox are considered alike contagious and greatly dreaded. On the appear-



ance of the latter in a village it is deserted by the young and strong whose relatives are not attacked, and nothing will induce a Lepcha from another part of the country to visit an infected village. Vaccination is already greatly prized by these people, for which fortunate circumstance we are indebted to Doctor Pearson's success in introducing it among them; its preservative blessings are eagerly sought for at Dorjeling by them, and the Bhotiahs from remote parts of Nipal and Sikkim.

Goitre is known among them, but is by no means common; among 200 persons at this place now, I can find but one goitred individual, and that is a woman. Ophthalmia is I think very uncommon, and syphilis rarely met with. During fifteen months residence, I have seen one case of leprosy only in a Lepcha, and although the mountainous nature of their country renders the climate sufficiently damp and cold, rheumatism seems to be a rare disease; on the whole they are decidedly exempt from many of the ills which flesh is certain heir to in the most favoured countries of the globe. Consumption I have never met with, nor liver disease, nor dysentery, nor do they know the cholera by name even. These four scourges of Europe and India find no food to feed on among the Lepchas.

In person the Lepchas are short, averaging about five feet in height; five feet six is tall, and four feet eight is a common stature among the men. The women are short in the usual proportion. The men are bulky for their height, but rather fleshy, than sinewy. The muscular development of their limbs is greatly inferior to that of the Magars, Gurungs, Murmis, and other Purbottiahs. They are very fair of skin, and boys and girls in health have generally a ruddy tinge of complexion; this is lost however in adolescence, although the fairness continues. The features are markedly Mongolian, but there is a fulness and roundness of feature, accompanied by a cheerful expression and laughing eye, which renders the face a most pleasing one. The total absence of beard, and the fashion of parting the hair along the crown of the head, adds to a somewhat womanly expression of countenance in the men, and the loose bed-gown sort of jacket with wide sleeves which they wear, contributes still more to render it rather difficult for strangers to distinguish the sexes,

especially in middle age. The men very often look like women, and the women sometimes like men. The hair is worn long by both sexes, the younger men allowing it to hang loose over the shoulders, the elders plaiting it into a tail, which sometimes reaches to the knees. The women of station wear their hair in two, and sometimes in three tails, tying it with braid and silken cords and tassels. The Lepchas, both male and female, are dirty in person, rarely having recourse to ablution. In the cold and dry season this renders them unpleasant inmates of a close dwelling, but in the rains, when they move about and are frequently wet, they are passably clean and sweet.

The temperament of the Lepcha is eminently cheerful, and his disposition really amiable. In ordinary intercourse they are a very fascinating people, and possess an amount of intelligence and rational curiosity not to be met with among their Bhotiah, Limboo, Murni, or Gurung neighbours, and indeed rarely if ever to be seen among people so completely secluded from foreign intercourse as they always have been. The marked contrast in these respects with the listless, uninquiring native of the plains, renders association with them a source of much pleasure to Europeans. They are wonderfully honest, theft being scarcely known among them; they rarely quarrel among themselves, and I have never seen them strike one another. "Do you ever fight?" was asked of an intelligent Lepcha; "No, never, (was the reply) why should we, all Lepchas are brothers, to fight would be unnatural." For ordinary social purposes of talking, eating, and drinking, they have great unanimity, but for any more important purposes of resistance to oppression, the pursuit of industry, or trade, their confidence in one another is at a very low pitch; they fly bad government rather than resist it, and prefer digging for yams in the jungle, and eating wretchedly innutritious vegetables, to enduring even the ordinary annoyances of working for wages. Although they have been called "a military people," I am disposed to consider them as wholly averse to arms, in the usual acceptation of the term. If it be military to carry a long knife, bow and arrows, yet to eschew the use of them against their fellow creatures, then, are they a military people; if it be not, they are

much more a hunting than a military tribe. I do not mean to insinuate that they are wanting in courage to fight, or that they might not, under English tuition and example, make good soldiers; but only to say, that deprived as they long, or always have been of any union in government, or as subjects of any one state, they have not that spirit of personal enterprise, and disregard of personal danger, which when constantly exhibited gratuitously, or for glory's sake, gives races of men the stamp of military habits.

We have no record of Major Latter's opinion of the Lepchas, who aided him on behalf of Sikkim during the Nipal war, but I have heard since my arrival in this quarter that at Nagri, after the Sikkimites were expelled thence by the Goorkas in 1812 or thereabouts, they proved most troublesome enemies, by their custom of lying in wait in the neighbouring forests for months at a time, and losing no opportunity of carrying off and massacring any luckless Goorkha who happened to stray out of musket range of the stockades. They are pretty good marksmen with the arrow, but do not practise it regularly; they use it poisoned in hunting as well as in war.

The Lepchas are poor agriculturists, their labours in this art being confined to the careless growing of rice, Indian corn, murwa,\* and a few vegetables, of which the brinjal, cucumber, and capsicum are the chief. Their habits are incurably erratic, they do not form permanent villages, and rarely remain longer than three years in one place, at the expiration of which they move into a new part of the forest, sometimes near, often distant, and there go through the labour of clearing a space for a house, building a new one, and preparing the ground for a crop. The latter operations consist in cutting down the smaller trees, lopping off the branches of the large ones, which are burnt, and scratching the soil with the Bān, after which, on the falling of a shower of rain, the seed is thrown into the ground.

Their houses are built entirely of bamboo, raised about five feet from the ground, and thatched with the same material, but a smaller species, split up. This roofing is, I believe, pe-

\* *Sesasum orientalis*.

culiar to this part of the country ; it is an excellent one, and a roofing of it, especially when exposed to smoke, endures about five years. It has been adopted by us at Dorjeling, and is undoubtedly the most convenient and cheap roof as yet obtainable.

I hope to furnish presently a few memoranda on the Limboos, and crave indulgence as to the defects of this letter, in consideration of the few opportunities which have as yet been offered me of mixing with the Lepchas, beyond a very limited space of country around Dorjeling, and on the Nipal frontier, in the immediate neighbourhood of the Mechi river.

*Vocabulary of the Lepcha Language.*

fire, mē	grey, tok-took
water, oōng,	ivory, tangmoovik
mud, phāt	a boat, too
wood, kōōng	fish, nghoo
iron, pinjing	a snake, boo
copper, song	bird, pho
silver, kom	tiger, sitong
gold, jere	good, riupa
house, lē	God, rim
man, murrōh	the sun, suchum
woman, aiyoō	moon, lavo
old man, puneom	stars, sohōr
young ditto, phaling	clouds, punbrōōng
ditto woman, phaling yeu	thunder, sungmut
cow, long	lightning, suleop
bull, bop	rain, so
he goat, sarehrōō	snow, sonong
she ditto, sārīnōt	wind, sorum
dog, kūshōō	a river, oong kioong
bitch, kūshōō mot	pool, oong-lup
fowl, heek	mountain, lole
cock, abōō	valley, bionsgi
hen, amot	country, leang



wild dog, sitōōm	road, lom
deer, siveen	bridge, reep
elephant, tengmōō	ridge, bleoo
father, ābo	jungle, puszok
mother, amōō	spring of water, oong
brother, eng	rock, long
sister, anōm	tree, koong
son, akup	grass, piay
daughter, te yeu	bamboo, po
eldest brother, anum	ratan, roo
younger brother, eng chumbo	belly, tubok
uncle (maternal) anen	tongue, ālēē
ditto (paternal) ākōō	thigh, alūm
aunt (maternal) azong	leg, atong
ditto (paternal) aneū	foot, tonleok
cousin, namkup	heel, tuntong
husband, gudosum	arm, pok-chom
wife, kusiyeu	hand, akuli
paddy, zo	finger, kuzseok
rice, zo-yeu	nail of ditto, punchi
barley, mong	thumb, kudom
wheat, krōō	knee, tukput
flour, krōōtu	eye-brow, mik-miong
yams, bookh	eye-lash, mik-chiom
milk, neene	elbow, kūrtoō
butter, mor	far, tongdom
salt, vom	child, ong
pepper, sukār	horn, aron
garlic, mungoo	hoof, ātet
spirits, ārok	hide, atoon
beer, chee	bow, silēē
tobacco, tamka (Hindi)	arrow, chong
sugar, (no word)	sword, paieūk
pawn, (ditto)	gun, sidermi
bread, (ditto)	gunpowder, jai
cotton, kirup	ball, dieu
sheep wool, lenk amuel	stockade, gree
hair, achom	soldier, vik

skin, atoon	war, dioolung
bone, kiang-moo	plunder, anzom
blood, vi	hunger, kridok
head, atruk	thirst, kridok oong
eye, amik	sleep, mitup
ear, aneor	oil, nim
nose, tungnom	mustard, kundong
mouth, abong	flesh, mun
chin, tugho	hard, abit
lips, adool	soft, achok
teeth, aplo	wet, shelnoh
beard, kirut	dry, sonpa
mustaches, bongmot	heavy, ateem
neck, tuk tok	light, akioong
chest, kurgoo	cheap, chepai
back, achung	dear, koopai
fruit, abum	light, sasong
flower, boor	dark, sonup
leaf, lop	calm, sugmut mudinik
branch of tree, akong	wind, sugmut
root, aphea	raw, azsroe
warm water, oong rhum	boiled, amen
cold ditto, oonguing	roasted,
white, adom	deaf, muteune
black, anok	dumb, leenmueneh
green, aphom	lame, rhuth
blue, phonplung	blind, mik misheur
red, ayhur	sick, dok
yellow, poiorbo	before, han
bad, muriuneh	small, slender, atim
fat, ateem	sweet, ampa
lean, achim	sour, cheorpa
short, atan	bitter, kaipa
tall, arhen	behind, alon
broad, aliok	right, fukzer
narrow, achim	left, tukbliong
long, tukphune	above, atong
strong, chet	below, ameen

weak, chet munea neh  
large, ateem

quick, drom drom  
slow, taioh

*Cardinal Numbers.*

1 kat	35 kakas kuttee phongotup
2 neath	36 kakas kuttee trok top
3 sum	37 kakas kuttee kucheop tuk
4 phulut	38 kakas kuttee ku ku tup
5 phungah	39 kakas kuttee kutten tup
6 trok	40 kaneath
7 kucheok	41 kaneath sa kat
8 kũ kũ	42 kaneath sa neath
9 kuteu	43 kaneath sa sum
10 kutu	44 kaneath sa phulut
11 kutup	45 kaneath sa phongoo
12 neatup	46 kaneath sa trok
13 sumtup	47 kaneath sa kucheok
14 phulectup	48 kaneath sa ku ku
15 phoongotup	49 kaneath sa kuteu
16 troktup	50 kaneath sa kuttee
17 kucheoktop	51 kaneath sa kuttee ku tup
18 ku-kutũp	52 kaneath sa kuttee neatup
19 kutentup	53 kaneath sa kuttee sum tup
20 khaka	54 kaneath sa kuttee phulee tup
21 khakaskat	55 kaneath sa kuttee phongotup
22 kakasneath	56 kaneath sa kuttee trok top
23 kakassum	57 kaneath sa kuttee kucheoktup
24 kakasphulut	58 kaneath sa kuttee ku ku tup
25 kakasphungah	59 kaneath sa kuttee kutuc tup
26 kakastrok	60 kasum
27 kakas kucheok	61 kasum sa kat
28 kakas ku ku	62 kasum sa neat
29 kakas kutesh	63 kasum sa sum
30 kakas kuttee	64 kasum sa phulut
31 kakas kuttee katup	65 kasum sa phungoh
32 kakas kuttunea tup	66 kasum sa trok
33 kakas kuttee sum tup	67 kasum sa kucheok
34 kakas kuttee phuleetup	68 kasum sa ku ku

69 kasum sa katui	75 kasum sa phongotup
70 kasum sa kuttee	76 kasum sa trok tup
71 kasum sa katup	77 kasum sa kucheoktup
72 kasum sa neatup	78 kasum sa ku kutup
73 kasum sa sumtup	79 kasum sa kuteutup
74 kasum sa phuleetup	80 kaphuleet

### *Lepcha Alphabet.*

#### *Vowels.*

The first is pronounced more like o than the English ă. The second is the Scotch ă as in ăwă. The third is sounded as written, with the accent on the final ă. The fourth is the long ē, as initial of eclipse, or ee in peer. The fifth is the English o, as in obey. The sixth is pronounced as the English word awe. The seventh represents u, but its pronunciation is not so labial, I cannot give the exact sound; it is formed by a slightly suppressed expedition. The eighth is the long ū, as oo in pool. The ninth is sounded as one word, yea.

úh    ă    yeō    ē    o    ăwē    eo    ōō    yeh.

#### *Consonants.*

kúh	kă	keuh	keo	keeo	
guh	gă	geuh	geo	geeo	
buh	bă	beuh	beo	beeo	
muh	mă	meuh	meo	meeo	
puh	pă	peuh	peo	peeo	
fuh	fă	feuh	feo	feeo	
hu	hă	heuh	heo	heeo	
ruh	ră	reo,	khuh	khă	kheo
tuh	tă	teo,	thu	thă	theo
duh	dă	deo,	luh	lă	leo
kluh	klă	kleo,	gluh	glă	gleo
pluh	plă	pleo,	phlu	phlă	phleo
bluh	blă	bleo,	vo	vă	veo
mluh	mlă	mleo,	hluh	hlă	hleo
phuh	phă	pheo,	nguh	nga,	chuh
chă,	nuch	nyă,	nuh	nă,	chzuh



chzā,	ú	ā,	jhuh	jhā,	yuh	yā,
shuh	shā,	zuh	zā,	suh	sā,	
tshuh	tshā,	tchuh	tchā,	tchōt.		
ōng	ung	āng	ing	ēēng	oong	ong
eung	ōōn	yeng	yeong	yong	yeūng	yeung
yeeng	ok	uk.				

*Note on the above.*

NOTE.—With the above interesting paper I received from Mr. Campbell a specimen of the Lepcha character, in the text and running hands, as well as the alphabet, the sounds of which are given above, in the letters expressing each sound. Mr. Csoma Korosi informs me that these characters, and the language itself have no affinity to the Thibetan, nor to any dialect of it, nor to the dialects of any other oriental language with which he is acquainted. To give a correct lithographed copy of the Lepcha character would be impossible, without submitting the impression to some one acquainted with the language, as the letters are complicated, and very peculiar. It is my intention to await the receipt of Mr. Campbell's promised notices of other Hill tribes, who may have, like the Lepchas, a character of their own, or whose language, exhibiting a mere dialectic difference from the Lepcha, may be expressed in symbols not dissimilar to those now before me. Availing myself meanwhile of Mr. Campbell's assistance in correcting the lithograph of the Lepcha alphabet, I shall be in a position to compare this and the vocabulary with other (possible) characters and tongues in use among neighbouring sept; the affinity of the language may be thus in some sort ascertainable, as forming, perhaps, with its dialectic differences, a distinct family. This may lead to a result in philology which students in the science, as illustrative of general history, might possibly turn to some account.

*Notice of some counterfeit Bactrian coins.*

Several forgeries of ancient Bactrian coins having within the last eighteen months come to my knowledge, I am induced to make them public, as a caution to our countrymen in Afghanistan, who are so zealously engaged in collecting these rare and valuable relics of the Grecian power in upper Asia.—I cannot better commence this notice, than by quoting the following passage regarding a square silver coin of Amyntas from an article in the *Journal des Savants* for February 1839; where

Mons. Raoul-Rochette says, "what renders me also a little suspicious regarding the silver coin of Amyntas is, that I observe there, with the exact repetition of the copper coin published by Mr. Prinsep, the sloping cut in the lower part of the coin—which, whether an accident attributable to its make or to its antiquity, does not appear to me to be reproduced on any other coin of different metal, though of the same mint."

From this description I feel convinced that this silver coin of Amyntas, which is of square form, and similar in all respects to that published by Mr. Prinsep, is a forgery, cast in a mould formed from the identical copper coin published by Mr. Prinsep, which belonged to Colonel Stacy. This coin, which was stolen from the Colonel in 1837, must have been carried back to the Punjab, from whence it originally came, where a forged silver coin was made from it, and sold to General Allard; who in 1838 forwarded a sketch of it to France, which arrived in time for publication in the *Journal des Savants* for February 1839. Such is the history of this remarkable forgery of a rare coin, which we may still hope to recover from the Punjab, along with the rest of Colonel Stacy's valuable collection. The lovers of numismatic science will be pleased to learn that a genuine copper coin of Amyntas, of square form, and similar in all respects to that which belonged to Colonel Stacy, but in less good preservation, exists in France in the collection of General Court, of which a description may be found in the *Journal des Savants* for February 1839.

Accompanying the sketch of the silver piece of Amyntas were sketches of two other silver coins of square form, both of Menander, and both acquired in the Punjab by General Allard. The reverse of these new coins were an owl, and the Macedonian buckler with Medusa's head—two types that were already known in copper; which circumstance has led M. Raoul-Rochette to suspect them to be "the work of some forgers." The fact of these two suspicious silver pieces of Menander having been acquired in the same year with the forgery of that of Amyntas, and by the same person, in the same country, united to their perfect identity in all their elements with copper coins

already known, and added to their shape and size, (that of a square didrachma, which is altogether unprecedented in any Grecian monetary system), all seem to render it highly probable that these two square silver pieces of Menander are likewise forgeries.

Of the forged coins that have come under my own notice, I can speak with more certainty; the most remarkable of which is a gold piece of Apollodotus, of square form, and of small size, belonging to Col. Sir C. M. Wade, c. B. whose valuable collection of coins I was kindly permitted to examine in October 1838. This piece is identical in type and legend, in make and general appearance, with the square silver coins of that prince, which are so well known, and it has evidently been cast in a mould formed from one of the silver coins, for the edges of the gold piece are sharp, and bear the marks of the file, and the point where the metal was run in is easily known by the confusion of the letters at the *same* place on both sides of the piece. I have seen about twenty of the square silver coins of Apollodotus, and I can vouch that this gold piece has not the same clearness and sharpness which is observable in the letters of the genuine coins; a circumstance owing to its having been cast, and not stamped. Besides which the only known *gold* Bactrian coin is of round form; which alone would lead me to suspect the genuineness of this new piece, but when to its square form (which is quite novel in gold) is added its perfect identity in type, size, and make, with the square silver coins of that prince, I have no hesitation in recording my belief that this is a spurious medal.

The forgeries next in importance are two thick round silver pieces of Azes, of large size: only one of these pieces is of good silver, the other being of base metal. From some slight obvious variations, they have evidently been cast in moulds made from two different copper pieces of the commonest type of the coins of Azes; having the bull on one side, and the Indian lion on the reverse. The piece of good silver is covered on both sides with minute holes, which might possibly have been produced by the action of acid in cleaning the piece from rust; but its edge, which has been hammered all round, proves to my

mind that these minute holes have been occasioned by the piece having been cast, and these peculiar appearances, added to its identity of type, shape, and thickness, with the copper coins, prove it to have been cast in a mould made from one of the commonest copper types of Azes.

The other piece, of base metal, has been manufactured by a less skilful person, for the edge betrays that the halves of the mould had overlapped each other, the projecting rough parts having been only partially filed away: the mouth of the mould is easily discovered by the obliteration of several letters of the legend on both sides at the *same* place, and there is a considerable flaw beneath the figure of the bull, the result of a large air bubble in the cast metal.

The genuine silver coins of Azes are, besides, of a different type, size, thickness and make, and are easily discernible by a practised eye.

The other forgeries which I have seen are of Indo-Scythic gold coins, and these from the barbarous make of the originals are not so easily detected. I have met with at least twenty cast coins of Kanerkas, which have a figure standing to the left on the obverse; and a figure standing to the front with a bull to the left on the reverse, with the legend OKPO: and I have seen four or five cast pieces with the same obverse, having on the reverse a seated female figure with the horn of plenty in her left hand and the legend APΔOXPO.

These spurious pieces which merely reproduce in nobler metals, types and names already known, are easily detected by any one conversant with the published coins of Bactria; and I trust that this brief notice will be of some small service to such of our countrymen in Afghanistan as may be only novices in numismatics.

A counterfeit of another kind, the work of an ancient forger, I hope soon to lay before my readers in a notice of a plated copper drachma of Antimachus.

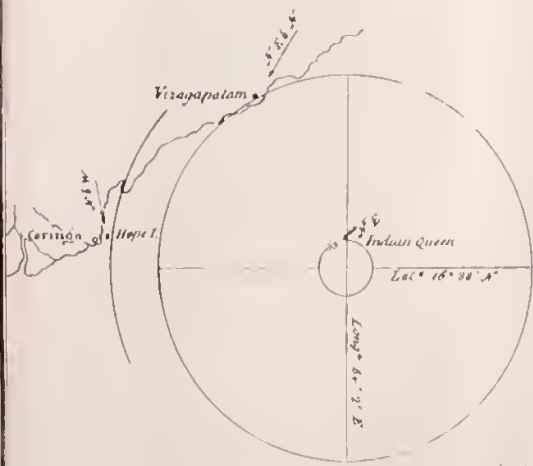
ALEXANDER CUNNINGHAM.

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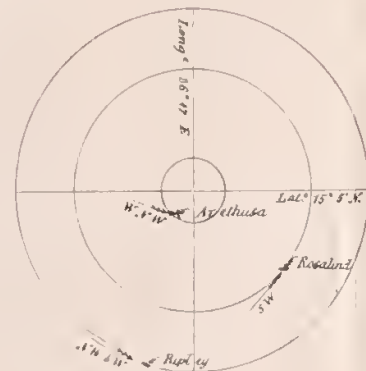




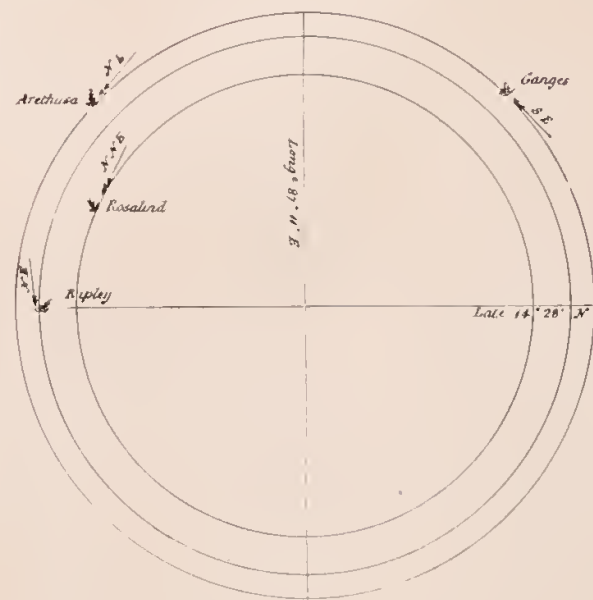




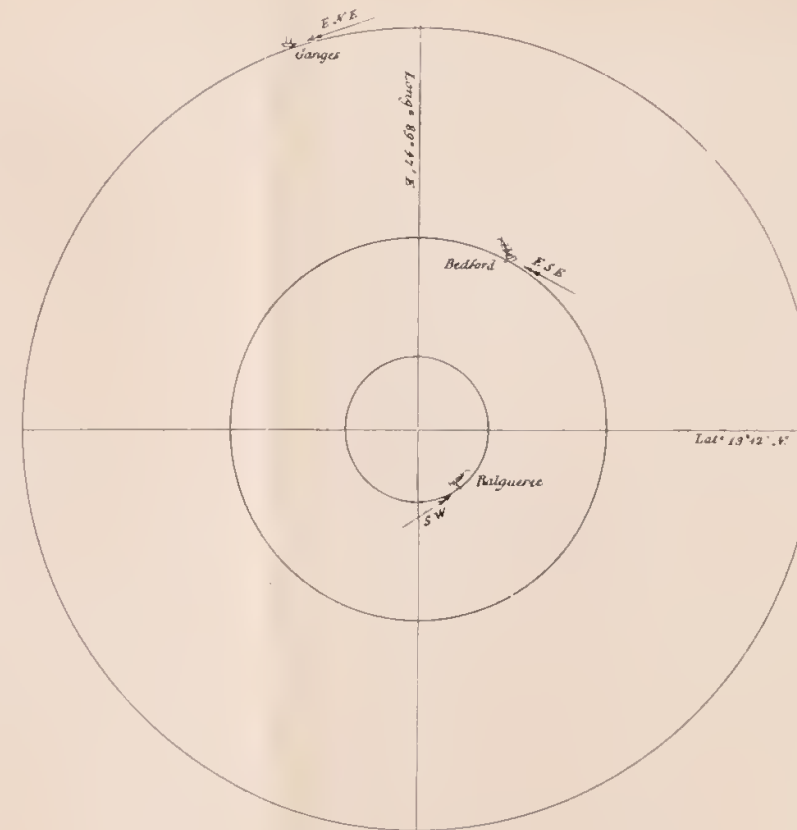
A\* I Diagram for the 10<sup>th</sup> Nov 1839. Noon  
outer circle 150 Miles in diameter



A\* IV Diagram for the 15<sup>th</sup> Nov 1839. Noon  
outer circle 140 Miles in diameter.



A\* III Diagram for the 14<sup>th</sup> Nov 1839. Noon outer circle 230 Miles in diameter



A\* II Diagram for the 13<sup>th</sup> Nov 1839. Noon outer circle 300 Miles in diameter



A\* I Diagram for the 12<sup>th</sup> Nov 1839. Noon outer circle 280 Miles in diameter





*A Second Memoir on Indian Tempests, with reference to the Theory of the Law of Storms.—By HENRY PIDDINGTON.*

PART II.

On the 16th November, 1839, an awful hurricane visited Coringa, by which that station was nearly destroyed. I have used my best endeavours to collect all the information possible, and the following, which I have first given in statements and logs, abridged where necessary, and afterwards in the tabular form as before, will shew the results of my labour. It will be seen that we have for this hurricane thirty-two logs and reports, and that we have traced it from near the Great Andaman, in latitude  $13^{\circ} 20' N.$ , longitude  $91^{\circ} 52' E.$  to Coringa and Vizagapatam; our observations extending thus over about 654 miles in five days, and crossing all the Bay of Bengal.

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*Abstract of the log of the Brig "Arethusa," Capt. Chaplin, from Madras to Calcutta. Reduced to civil time.*

11th November, 1839.—At noon lat. obs.  $16^{\circ} 11' N.$ , longitude  $84^{\circ} E.$

12th November.—Increasing breezes EbN. to NE. East and ENE. cloudy weather and rain; almost constant rain or squalls during the night. 6 A. M. squally, heavy and constant rain. 8 A. M. increasing breezes, appearance of an approaching gale. Noon, strong breezes with frequent heavy squalls of wind and rain, wind ENE. sun obscured, latitude  $16^{\circ} 34' N.$ , longitude  $84^{\circ} 20' E.$  strong breezes ENE. to NE. cloudy. 6 P. M. decreasing breeze; at 7. 30 P. M. latitude by star  $16^{\circ} 22' N.$

13th November.—From 9 P. M. to 4 A. M. increasing breezes and sea; dark cloudy weather, and heavy top sea. Wind NEbN. 8 A. M. every appearance of an approaching gale. 11 A. M. a very heavy squall, wind and rain, which hove the brig on her broadside for fifteen or twenty minutes. Noon fresh gale NE. under double-reefed topsails. No observation. Latitude  $15^{\circ} 52' N.$ , longitude  $85^{\circ} 18' E.$ , strong gales NE. throughout with squalls till midnight.

14th November.—At 4 A. M. increasing gale with very high sea, ship labouring and plunging very heavily. 8 A. M. Ditto gales, with fre-

quent heavy squalls of wind and rain to noon. No observation. Latitude  $15^{\circ} 50' N.$ , longitude  $85^{\circ} 46' E.$  Noon, NE. wind; severe heavy gale, frequent squalls of wind and rain, increasing sea to midnight.

*15th November.*—At 2 A.M. the same. Hove to under close-reefed main top-sail, carried away flying-jib-boom and one shroud of the main rigging. Noon, strong gales. Wind at 3 A.M. NE. At 6, North. At 8, NNW. At 10, WNW. No observation. Latitude  $16^{\circ} 00' N.$ , longitude  $86^{\circ} 06' E.$  P.M. strong heavy gale, WNW. and constant rain. 2 P.M. increased to a perfect hurricane, vessel lying on her broadside at 4 P.M. with wind at WSW. At 9, wind SSW. At 11, gale moderating with frequent heavy squalls. Midnight, wind SSE.

*16th November.*—At 4 A.M. decreasing. At 6 A.M. wind SE. Bore up. At 8, fresh breeze, &c. cloudy to noon, when fine. Latitude observation  $15^{\circ} 30' N.$ , longitude  $85^{\circ} 09' E.$

*17th November.*—Fine breeze SE. throughout. Latitude  $17^{\circ} 33' N.$  longitude  $86^{\circ} 05' E.$

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*Translation of an Extract from the log of the French Ship "Le Balquerie," Captain Thore. Reduced to civil time.*

*At Noon, 12th November.*—Wind variable from W. to NW. heavy constant rain, strong squalls NW. to NNW. No observation. Latitude by account  $11^{\circ} 36' N.$ , longitude by account  $90^{\circ} 20' E.$  Bar. 27.15 (French) or 28.95 English. To midnight squally weather, continual rain, a swell from the eastward, wind from NW. and NNW. in violent squalls.

*13th November.*—At midnight the wind hauled to west, and towards daylight blowing strong from the SW. with a considerable sea. No observation. Lat. by account  $13^{\circ} 15' N.$ , longitude  $90^{\circ} E.$  Bar. 27.82 French, or 29.66 English.

*14th November.*—Wind hauled to the SE. At daylight squally, with heavy rain. A heavy confused sea. No observation. Latitude by account  $16^{\circ} 20' N.$ , longitude  $88^{\circ} 54' E.$  Bar. 27.8 French, or 29.64 English. P.M. Cloudy, squally, and much rain and sea, wind North-easterly, with strong squalls towards night.

*15th November.*—At daylight wind hauling to the east. No observation. Latitude by account  $17^{\circ} 56' N.$ , longitude  $87^{\circ} 50' E.$  Bar. 27.9 French, or 29.74 English. Cloudy, squally weather; squalls from NE. to NNE. with a good deal of sea.

16th November.—At midnight weather moderating a little; lightning in the SE. quarter. At daylight squally and rain. Wind at ENE. and E. Latitude by observation  $20^{\circ} 10'$  N. longitude  $88^{\circ} 49'$  E. Bar. 27.12 French, or 28.90 English. Noon, fine weather, pleasant breeze from E. to ESE. At half-past nine saw the Lighthouse on False Point Palmiras, very close. *Remarks.* During the ten days from the Equator to Point Palmiras I may be said to have had constant rain.

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*Extract from the log of the ship "Duke of Bedford," Captain Bowen, bound to Calcutta. Reduced to civil time.*

12th November, 1839.—At noon, wind SE. fine

|   |                     |                     |
|---|---------------------|---------------------|
| { | Lat. observation,.. | $11^{\circ} 41'$ N. |
|   | Longitude, .....    | $91^{\circ} 21'$ E. |
|   | Barometer, .....    | 30.00               |
|   | Thermometer, .....  | $82^{\circ}$        |

13th November.—Wind SSE. to EbS. squalls and rain throughout. No observations.

|   |                    |                     |
|---|--------------------|---------------------|
| { | Lat. per account,  | $14^{\circ} 49'$ N. |
|   | Longitude, .....   | $90^{\circ} 22'$ E. |
|   | Barometer, .....   | 29.90               |
|   | Thermometer, ..... | $81^{\circ}$        |

P. M.—Heavy squalls ESE. At midnight Bar. 29.80, and falling.

14th November.—Weather very threatening, and a low scud flying rapidly over. Furling the topsails and up foresail. During the forenoon blowing very hard. Barometer stationary. At 9 A. M. set close-reefed main-topsail, fore-sail, and main-trysail. Got a glimpse of the sun at noon; found ourselves at least sixty miles to the northward of our account since noon of the 12th,

|   |                    |                     |
|---|--------------------|---------------------|
| { | Latitude, .....    | $17^{\circ} 35'$ N. |
|   | Longitude, .....   | $90^{\circ} 20'$ E. |
|   | Barometer, .....   | 29.80               |
|   | Thermometer, ..... | $80^{\circ}$        |

A little after noon, blowing in heavy gusts. 4 P. M. Bar. 29.70. Down top-gallant-yards and struck masts.

15th November.—Up fore-sail and furling it. Torrents of rain throughout, with vivid lightning. No observation.

|   |                                 |
|---|---------------------------------|
| { | Lat. per account, 18° 27' N.    |
|   | Longitude, . . . . . 89° 35' E. |
|   | Barometer, . . . . . 29.80      |
|   | Thermometer, . . . . . 80°      |

Blowing hard at east, and heavy rain. At 11 P. M. a sudden lull and calm, with vivid lightning SSE. Clued up the main-top-sail. At 11h. 20m. P. M. again freshening at east. During the 14th and 15th a great number of land birds and dragon flies about the ship; some of the former were caught.

16th November.—Weather continued till noon. No observation.

|   |                                 |
|---|---------------------------------|
| { | Lat. per account, 18° 20' N.    |
|   | Longitude, . . . . . 89° 05' E. |
|   | Barometer, . . . . . 29.90      |
|   | Thermometer, . . . . . 80°      |

P. M.—Thick weather. At present clearing off. Made sail.

17th November.—A light breeze throughout, easterly. At A.M. sounded, 60 fathoms, blue mud. And at noon,

|   |                                 |
|---|---------------------------------|
| { | Lat. observation, 20° 42' N.    |
|   | Longitude, . . . . . 89° 45' E. |
|   | Barometer, . . . . . 30.05      |

We have experienced a current of at least sixty miles to the northward since noon of the 14th.

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*Ship "Cashmere Merchant," Capt. Warren, from Calcutta bound to Rangoon. Civil time.*

12th November.—At noon in lat. 16° 58' N., long. 92° 25' E. with light breezes and clear weather, increasing at midnight to strong and increasing breeze from ENE. and NEbE. to ESE.

13th November.—Increasing, but wind as before. Preparing for bad weather. Noon, no observation. Wind east, and varying to ENE. at times. Midnight strong gales.

14th November.—Gale increasing ESE. throughout. No observation.

15th November.—Strong gales ESE. heavy squalls and rain with a heavy sea. Noon, latitude by observation 17° 33' N. Weather the same, till midnight. P.M. Wind SE.

16th November.—ESE. fresh breezes and clear. Noon, latitude by observation 17° 29' N., longitude 92° 25' E. Weather the same till midnight.



17th November.—The same. ESE. to SE. breezes, and fine. Noon, lat.  $16^{\circ} 37'$  N. longitude  $92^{\circ} 7'$  E.

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*Abstract of the log of the ship "Rosalind," Captain J. Fenrose.  
 Reduced to civil time.*

13th November, 1839.—Strong gales NE. and squally, with heavy showers. Noon, no observation. P.M. Wind NNE. every appearance of an approaching gale. 4 P. M. Thick, cloudy, and very dark from the eastward. Wind the same, hard squalls and rain, prepared for bad weather. Hove to under close-reefed main topsail and reefed try-sail, very heavy cross sea. Wind and weather the same at midnight.

14th November.—A. M. Weather as before. Daylight, hard gales NNE. with heavy squalls of hail and rain. Noon, no observation. P. M. and till midnight, wind North to NbW. At 10 P. M. hard gales and stormy weather, with tremendous cross sea; lying to as before.

15th November.—A. M. The same weather, with much lightning. Wind veered to WbN. at 2 A. M.; to WbS. at 6 A. M.; and to SW. at 10 A. M., at which time it was blowing a hurricane. Sprung the main-mast-head. At noon, wind SW., shipped a heavy sea, which stove in the door and windows of the round house. Wind veering round the compass to SSW. at 1 P. M. No observation. The wind SSW. confused sea, strong breeze (gale?) and squally during the afternoon. At 6 P. M. wind SbW. Midnight, squally and rain.

16th November.—4 A.M. More moderate, and less sea at 9 A. M.; made sail at noon. Latitude by observation,  $16^{\circ} 15'$  N.

I was, unfortunately, not able to obtain a single longitude with this otherwise valuable log; so that I have been obliged to place the ship, by guess, on the track of the hurricane. Judging from the time of the varying of the wind, she must have been not far from the Ripley, and I have been guided by that vessel's very careful log, in placing the Rosalind. Captain Fenrose concludes his communication with the following remarks—"I have been at sea 41 years, and have remarked that previous to high winds the wind is variable. But previous to a hurricane, the sky is very clear. You can see objects at a very great distance, the sea very smooth, and at night the stars are very numerous, more than at other times; and at times during the day small clouds are seen at an immense height, such as sailors call, 'Mackerel Sky,' and their appearance changes very fast, some parts having the colour of the rainbow. If in north latitude,

the wind backs round contrary to the sun, it will increase ; if in south latitude the reverse.

“In the first hurricane which I experienced, in the Gulf of Mexico, the clouds of scud appeared to touch the masts ; this was on the 18th and 21st August, 1827.”

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*Extract from the log of the Brig “ Ripley,” Yorke Steward, Commander. Reduced to civil time.*

*Thursday, 14th November, 1839.*—On the 13th, at noon, latitude  $15^{\circ} 22' N.$ , longitude  $85^{\circ} 05' E.$  steering East and EbN. Strong monsoon with hard squalls and heavy rain. In the middle and latter parts of these 24 hours, wind steady at north, but gradually increasing and the mercury falling. At noon it was 29.65. Ther.  $75^{\circ}$  ; then blowing a heavy gale ; ship under close-reefed main-topsail. Noon, latitude by dead reckoning  $14^{\circ} 30' N.$ , longitude  $85^{\circ} 21' E.$  Ship's head to N.E. Wind veering to NNW. and NW. Barometer at midnight 29.50.

*15th November.*—At 8 A.M. Bar. 20.30, but not at all steady. Noon, it was 29.25. Ther.  $73^{\circ}$ . Throughout these 24 hours a heavy gale, with incessant heavy rain, and severe gusts of wind ; the sea comparatively smooth, ship lying to under storm trysail. The last 12 hours the wind appears to have been blowing at its greatest fury. Noon, latitude by account  $13^{\circ} 55' N.$ , longitude,  $85^{\circ} 58' E.$  Wind WNW. At 4 P.M. West. Mercury fluctuating from 29.30. to 29.40. 6 P.M. Wind WSW. moderating a little. Bar. rising. Midnight, wind SW.

*16th November.*—6 A.M. SSW ; at 9 A.M. SbE., and at noon SEbS ; At 10 P.M. it ceased raining. Strong breeze and fine clear weather ; towards noon moderating to a fresh breeze and clear weather, latitude  $15^{\circ} 38' N.$ , longitude  $86^{\circ} 57' E.$  Bar. 29.75. Ther.  $80^{\circ}$ . The following day the wind remained steady at SE. and settled fine weather.

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*Extract from the log of the Barque “ Sumatra,” Capt. Langlois, from Padang towards Calcutta. Reduced to civil time.*

*At noon 12th November, 1839.*—Latitude obs.  $15^{\circ} 29' N.$ , longitude  $91^{\circ} 02' E.$  To midnight fresh breeze, ENE.

*13th November.*—To 6 A.M., fresh breeze, ENE. ; 6 to 10 EbN. ; to noon ENE. Midnight strong breeze, squally and rain. Noon, fresh gale. Latitude by observation  $17^{\circ} 41' N.$ , longitude  $90^{\circ} 42' E.$  Wind ESE. Wind ENE. to 4 P. M. veering to East at midnight.

14th November.—Wind NEbE. to 8 A. M. ; ENE. to noon ; increasing breeze with small rain. Towards noon, squally appearance in the south-eastward, with a swell. Latitude account  $19^{\circ} 08' N.$ , longitude  $89^{\circ} 49' E.$  Wind ENE. to 2 P. M. ; then East, and EbN.  $\frac{1}{2} N.$  at midnight.

15th November.—Wind ENE. at 8 and till noon. P.M. Increasing gale and dark rainy weather, with a heavy sea. At sunset, hove to ; heavy gale, with constant rain, hard squalls occasionally to noon. Latitude account  $18^{\circ} 57' N.$ , longitude  $89^{\circ} 34' E.$  Hove to, till midnight.

16th November.—Hove to these 24 hours. Wind ENE. to E. ; heavy gales with a high sea, cloudy, dark weather, and increase of rain. Sunset, heavy squalls, and rain at intervals. Lightning to the southward. Daylight, less wind. Weather clearing up in the SW. Latitude account  $18^{\circ} 40' N.$ , longitude  $89^{\circ} 12' E.$  Wind ESE. to 8 P. M. and SEbE. to midnight.

17th November.—Wind SEbE. to 8 A. M. and ESE. and EbS. to noon. Weather moderating throughout. Latitude  $20^{\circ} 30' N.$ , long.  $89^{\circ} 30' E.$  P.M. fine weather.

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*Report of Captain Campbell, Assistant Surveyor General, Baramahl Survey, to the Secretary to Government, General Department.*

I have the honour to report to you, that the Barometers in the office of the Salem and Baramahl Survey, at present in quarters at this station, have marked the progress of the hurricane which appears to have visited Coringa on the 16th November. The Barometers are two, on the Syphon plan, and have been filled wet. By continued comparison it has been found that the greatest difference between the two is about .04 of an inch, and the least .02 inch, which difference appears to be less than the error between Mr. James Prinsep's standard Barometers. The instruments may therefore be relied on. From the observations, it appears, that the Barometer commenced falling here on the 6th November, and continued to do so regularly till the greatest depression was attained on the 20th, at 4 P.M. of the afternoon observation, and at 10 A.M. of the 21st November of the morning observation ; from that time, it regularly rose until the 26th November, when it indicated the same pressure as on the 6th. The greatest difference between the pressure on the

6th and the minimum was 0.16, of an inch ; the morning and afternoon observations giving the same results. The weather has been settled since the 7th November. Before the 7th the wind was settled to about NE., and variable, afterwards veering about from N. at W. but in no regular manner ; since the 26th it has settled at NE. and East again. I believe an abstract of the observations of pressure would be of no use, as from the great height of this place, 3,250 feet above the sea, they would not be comparable with any other set. I do not therefore forward them.

*Royacotta, 4th December, 1839.*

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*Report of G. A. Smith, Esq. Collector of Coringa, to the Secretary to Government, General Department.*

SIR,—I have the honour to submit the annexed statement of remarks made by myself at the time at Samulcottah, about eight miles inland ; those made by the Superintendent of the Lighthouse on Hope Island, off Coringa, and the extracts from the logs of the “ Jane ” and “ Indian Queen,” relative to the storm which visited the Rajamundry district, on the night of the 16th ultimo. It has been observed to me, that though the inundation of the sea was attributable to the East wind, and had that continued a short time longer the consequences would have been still more disastrous, yet that the wind was actually stronger, and more damage was done to houses, &c. after it shifted to the SE. This is also borne out by my own observations, since made, on the manner in which property has been damaged in different places ; but still both remarks may be correct with reference to the positions in which they were made, particularly as the latter part of the storm came principally in gusts. The oldest inhabitants remember a storm of a like nature, and equally disastrous in its consequences, which visited this district in the year 1787, since that time, there have been storms and inundations at intervals, the last having been on the 10th May 1832, but nothing in comparison with the present.

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*Observations of George A. Smith, Esq. Collector of the District of Rajamundry, on the storm of 16th November 1839.*

On the night of the 16th instant, this district was visited by a most awful storm, attended by an inundation of the sea, which has



destroyed many villages on the Coast, and caused a very heavy loss of life, I fear, at least, to an extent of five thousand; including those from the number of vessels wrecked. According to my own observation, the storm commenced about 10 P.M. of the 16th from the North-East, it afterwards veered round to the Eastward, from which point it blew strongest, and after lasting six hours, ceased about 4 A.M. of the 17th, the wind having got round to the Southward. I had not the means of referring to a Barometer, but I have understood that the fall was about an inch.

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*Observations of Mr. W. L. Pascal, Superintendent of the Lighthouse on Hope Island off Coringa, on the Hurricane of 16th November 1839.*

*On the 16th November. 1839.* Saturday, at about 8 A.M. it commenced blowing fresh from the North-Eastward, with mizzling rain, and continued so till 1 P.M., when the wind shifted round to the NNW. and terminated into a gale. About 2 P.M. the wind shifted to NW. when the river commenced rising, and at 8, the Island was under water. At 10, the wind hauled round to the NE. and blew a dreadful hurricane, (during which time the water rose to about 2 feet in the Lighthouse, with a heavy confused sea beating against it, which burst open the door, and swept away every article in it; at this time the top of the Lantern wrenched and whirled itself aloft. The conductor broke into five pieces, and my house was completely washed away, with every article it contained. At 12 A.M. the wind shifted to the Eastward, and at 1 A.M. 17th, Sunday, it shifted to the South-Eastward, and blew tremendous strong; at 2 the water began to recede; at day-break the weather cleared up, and we found five corpses on the Island.

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*Extract from the log book of Schooner "Jane," furnished by Capt. Hazlerood.*

*14th November.—1839.* The Schooner "Jane" at sea, in longitude  $89^{\circ} 20'$ \* and latitude  $17^{\circ} 10' N.$  At 10 P.M. the gale commenced from the Eastward, and continued from that quarter till the 16th, and then the wind changed to the SE. and cleared up. During the gale, we

\* This must be I think an error of the copyist's, for  $89^{\circ} 20'$  would require a drift of 250 miles to have made the last as subsequently mentioned. I suppose  $87^{\circ} 20'$  to have been the vessel's position.—H. P.

were drifted away to the Northward three degrees. On the 17th, made the land about Ganjam. On the 19th, passed Vizagapatam, and were boarded by a catamaran, which informed me that four native vessels had been wrecked at that place, and the "Indian Queen" put to sea, leaving her Commander on shore. On the 20th, when steering for Juggernathpooram roads, saw the coast strewn with wrecks of native vessels, and passed 15 bodies of both men and women, and lots of buffaloes. On the 21st came to an anchor in Juggernathpooram roads, and found the "Indian Queen" at an anchor, with the loss of her foremast and bowsprit.

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THE LATE HURRICANE.

*Extract of a letter from Coringa, Nov. 24, 1839.—"Indian Queen" outside.*

I have got the little finger of my right hand broken, so you must not expect a long letter, as I can hardly hold the pen. I put to sea last Saturday morning at 1 o'clock, as the weather looked very threatening (in Vizagapatam roads) and at 9 o'clock a gale of wind came on. At midnight we had our jolly boat washed away, pitched away the bowsprit, the foremast followed it, and main and mizen top masts. Both pumps choked, and the ship making water. When the boat went, it knocked in one of the stern ports, and filled the cabins. All hands baling ship and cabins with buckets; and had one sea come over us, we must have gone down. I assure you we have had a complete hurricane, and it is God's mercy we ever were saved; I never expected it. When the gale abated, we were in 25 fms. muddy water, and had it lasted another three hours, we should have been snug on shore. Thank God we are safe. Did you but see the horrible ravages the gale has committed at Coringa, you would be surprised; in fact it baffles all description. Every vessel in the river, and miles up, are on shore and in the jungle, and all the vessels outside, with the exception of seven, are all wrecked. Wrecks are lying about in all directions: innumerable dead bodies of men, women, and bullocks. Coringa is nearly washed away, Lighthouse, Flag-staff, and all. Captain Pendygrass of the "*Catherine*," and Captain Marshall of the "*Charles Dumergue*," both drowned, with their mates and apprentices. They were all on board the *Dumergue* at the time she broke adrift—went up the country, sprung a leak and went down; and I suspect

these gentlemen must have jumped overboard, and never reached the shore, as the vessel has since been got up, but no bodies in her. She has sustained a dreadful loss. Oh ! it has been an awful gale. I can't help feeling thankful for our safety, when I witness the horrible devastation of property and loss of life at this place. I hope you have not suffered so at Madras. I will give you a full account in my next. Captain Shreeve, I am sure, has put us down for lost, long ago. I consider our safety a most miraculous escape. We left four vessels in Vizagapatam roads ; all went on shore, were dashed to pieces, and every soul perished. Fancy *all that gale can do*—and then you will not guess half. Every person is starving here ; nothing to be got for love or money ; I would rather have been where I was, out at sea, than in the finest dock at Coringa. Every vessel has suffered, but poor Marshall and Pendygrass have been the worst ; and their vessels too at a place where you would think no gale that ever blew could hurt them.—*Madras United Service Gazette, Dec. 4.*

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AN AWFUL HURRICANE.

Four days tappal (the 11th to the 14th inst.) arrived simultaneously from Calcutta on Monday morning. The cause of their detention is found in the subjoined accounts of an awful hurricane experienced to the northward. It is most providential that at Samulcottah, where it appears to have raged with so much violence, not a life has been lost ; but we fear that from seaward and the immediate line of coast where the agitated sea made irruptions, bad accounts will be received. The devotion of the faithful sepoy guard over the treasure, when the warring elements seemed to dictate a quest of the nearest shelter, will elicit warm approval.

*Samulcottah, 18th November.*—The small station with its neat thatched cottages and well kept parade, is now a scene of desolation. It was visited on Saturday night by one of the most severe hurricanes ever known in this part of the country : it blew from 6 o'clock in the evening till 5 o'clock the next morning, carrying away the roofs of all the thatched houses, and leaving their inmates wet and shivering in the dread of the walls falling in upon them. Happily this was not the case ; but, with the exception of the Collector and Commandant, every officer is houseless, and even theirs' have been much shattered, though tiled. The sepoys' huts have been totally blown to pieces, and their

families have taken refuge in the verandahs of the barracks. One fact alone will illustrate the want of shelter now at the station :—two native officers with their families are occupying the solitary cells *at their own request*. Trees that have stood for eighty years are now blown down, even to the tamarind tree, which has generally such a firm grip of the earth. A magnificent specimen of one in front of the Collector's Cutchary is fallen. The whole country is under water, and the communication cut off from Cocanada and Ingeram, and we fear accounts from that quarter will bring us lamentable details of the loss of life and shipping.

A hurricane similar to this occurred here in 1832, but not so violent, or of so long a continuance.

Treasure to the amount of Co's. Rs. 1,50,000 was left unguarded on the plain ! but it was only for a short time, as the sentries who had been blown away, managed to crawl back and throw themselves on the bags ! A fine trait of devotion truly !

*(Another account) Nov. 18.*

‘It may be interesting to you to hear some accounts of the late most awful hurricane we experienced here—from about 8 o'clock of the evening of the 16th, till 4 the following morning—when the raging elements began to subside ; and when it became day-light, we were enabled to see the havoc that had been committed. And indeed to behold the scene it was heart-rending : all the thatched houses in the place unroofed—trees laid with the ground, and even some that must have stood all weathers for the last half a century. The Lines were quite destroyed—*not* one house from right to left that has not been blown down ; and as for the officers' houses, with the exception of the Major's, not one dry corner could be found ; and the scenes that were resorted to, to try and save themselves from the wind and rain, each man the next morning recounting his adventures, certainly made us smile in spite of the awfulness of the scene. Some got under tables, others under beds, some sat on chairs moving from one spot to another that could afford them shelter for the time, some were obliged to quit their houses and take refuge in the mess house, being a tiled building. You can hardly fancy the wreck that the place is in ; but just recall to your mind the scene that the Mount Road presented after the gale in 1836, and you *may* have some idea of how this place now looks—not *one whole* tree standing in the place—if not blown



down, all the large branches torn off, and only the trunk remaining—indeed we ought to be most thankful that no lives have been lost here. The accounts from Rajamundry are just as bad as this; and from Cocanada the reports are dreadful—that the sea has quite washed away the lower part of that village—from Coringa, and Nirapilly, nothing has been heard, but there is much alarm about their safety. We had a good deal of rain yesterday, and a good deal last night—which brought the Samulcottah river almost up to the only part of the old wall of the Fort now standing on the East side. The gale commenced about NE. came round by degrees to the East and got about SE. when it began to abate. The quantity of rain that fell is not known, as the Pluviometer was running over, and there is no knowing for what length of time. The Barometer fell about 1 inch from 12 o'clock on the 16th, till 12 o'clock of the 17th instant.

‘To-day there has not been much rain.’—*Spectator*, November 27th.

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(Another account.)

The subjoined particulars of an awful calamity with which Coringa and its neighbourhood have been recently visited, have just reached us. We lay them with a heavy heart before our readers, making no comment upon them, but leaving the sad tale of woe which they relate to speak for itself.

‘We were visited on the night of the 16th instant by the most terrible gale of wind possible. Your house at Ingeram is completely unroofed, the trees and walls of the compound destroyed, and P\*\*\* was very nearly drowned. All the European and native houses are uninhabitable, and there is nothing to be seen from Coringa to this, but a heap of ruins.

The wind began to blow in the afternoon of the 16th, but was moderate till about 11 o'clock at night, when it became furious, and lasted till 4 o'clock the next morning.

The water from the sea rushed in with such violence, that the only houses remaining at Coringa, are \*\*\*'s large house, and three or four other brick built houses. All the rest, it is said, have been carried away. I have had  $2\frac{1}{2}$  feet of sea water in my garden, and in my room which is under my bungalow,  $1\frac{1}{2}$  foot.

It is said that more than 20,000 people have perished by this terrible hurricane, which lasted only five or six hours. There is nothing

to be seen in every direction but dead bodies and drowned cattle. *Sixty* native vessels which were in the roads, laden with paddy, have disappeared, and it is not known what has become of them. The "*Union*," although she had *four* anchors and chains out, was carried away, and is now laying at a short distance from the middle of the river of *Nellapilly*. The "*Catherine*," which was in a mud dock, and well secured by the earth, was also carried away, but fortunately got into the "*Charles Dumergue's*" dock, which the last named vessel had left a few days before. The "*Charles Dumergue*" was drifted into the large river of Yanam, and is now half buried in a sand island, opposite where the ferry boat crosses over; but no news at all of her captain who was on board, and also of the commander of the "*Catherine*," his brother-in-law, and a few other people. They might have been all drowned, as all over the country was nothing but like the sea. You can have an idea of it when I tell you, that I see from my house a Choolia sloop lying quite near the white pagoda of *Onagalo*, which is four or five miles from Coringa in the interior of the land!—*Madras Herald*, 27th Nov.

VIZAGAPATAM.—The first five days fresh NE. monsoon,—the two last days a heavy gale, as hereafter described.

'The appearance of the weather on Friday evening, the 15th, betokened a gale, which commenced increasing during the night, when it blew hard on Saturday morning the 16th, with heavy squalls of rain from NE. to North, which continued, mostly from the North during the day.—The barque '*Indian Queen*' put to sea in the course of the night on Friday; and in the strength of the gale on Saturday, about 11 A. M., four Native craft (lately from Arrakan with grain on board) put to sea. Two others in a most unaccountable manner having cut their cables and made sail came on shore against the Northerly (off shore) gale!—The gale veered back to the Eastward, and blew hard during Saturday night from ENE. to East without much rain; and on Sunday morning it moderated a little, shifting to the SE. when it became more moderate, with occasional showers, and veering to South still more so, but continued to blow a fresh breeze from that quarter during the night. Monday morning the gale had subsided, and the wind was light and variable, with squalls of rain from W. to NW.—Noon, light variable winds from the Westward with unsettled and cloudy weather. It is said that nine hands are missing

from the crews of the two vessels wrecked here, and apprehensions are entertained for the safety of the Native craft that put to sea: two men were saved by the six tide-waiters and their catamarans off the Port.'—*Madras Herald*, 27th Nov.

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*Report to Government, by Charles Hawkins, Esq. Master Attendant,  
 Vizagapatam.*

For several days previous to the 16th and 17th November, it had blown a fresh North-east Monsoon wind, and two days previous, the sky had assumed a reddish, brassy, and cloudy appearance; particularly so, on the evening of the 15th, it still blowing fresh from the north-east, which increased steadily from the same quarter, during the night, to a decided gale, which blew hard on the morning of the 16th, when it veered to the northward and blew hard the whole day, varying from NE. to north, (mostly north) with occasional heavy gusts of wind and rain, the strength of the gale blowing about 10 o'clock A. M. In the evening the wind veered back to the eastward, and blew hard, and steadily during the night from ENE. to East, without much rain. On the 17th, morning, it moderated a little, and shifted to the south-east, and veering to south, it became still more moderate with occasional showers of rain during the day. It blew a fresh breeze from the southward during most part of the night of the 17th, and on the morning of the 18th the gale had subsided; wind light and variable, with squalls of rain from West to NW. Noon, light variable airs from the westward, with cloudy unsettled weather.

N. B.—This gale was not felt at the Military Cantonment of Vizianagram, distant N. by E. thirty miles, nor was it felt at a Military post forty miles west, where they had but a few squalls of rain with the monsoon strength of wind. From reports from the adjoining southerly district of Rajamundry, those parts must have experienced much heavier weather than has occurred in this district. I have seen it blow much harder here, during twenty-three years service at this port, but I have never seen a heavier sea; the surf breaking in nine fathoms water.

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*Extract from the log of the Barque "Indian Queen," in Vizagapatam  
 Roads. Civil time.*

15th November, 1839.—Strong breezes and cloudy weather, but discharging cargo.

16th November.—At 1h. 30m. A.M. of this date, the weather assumed a very threatening appearance. Slipped both cables, and stood to sea under a press of sail, to obtain an offing; wind from N. to NNE. and at 9 A. M. NE. strong gales, drizzling rain, and a high sea. Gale increasing at noon, hove to under main trysail, and made every preparation for bad weather.\* At 6 P. M. wind ENE. Gale increasing, with a heavy sea. At 7 A. M. jolly-boat washed from the stern and knocked in one of the stern ports, which admitted a great deal of water, both pumps choked, and all hands baling. Midnight, heavy gales, with violent blasts of wind every minute, and a high sea, all the sails blown away from the yards, though lashed to them. Wind veering from ENE. at 6 P. M. to SE. by midnight.

17th November.—At 1 P. M. the gale increased to a complete hurricane at SE.; pitched away bowsprit, foremast, main and mizen topmasts; put before the wind, which was at ESE. to save the rudder, and clear away the wreck, and hove to again. At 2h. 30m. A.M. trysail and gaff blew away. Wind at ENE. for one hour (1 to 2), but SSE. by half-past three, and South at 6 A. M. Heavy seas striking the vessel, which kept all hands baling. At daylight the weather, as before with a heavy cross sea running. At 6 gale abating, ship rolling gunnels under; made a little sail, wind at SW. by 7½ A. M. when sounded in 25 fathoms, and saw Juggernautporam, bearing West. Noon, strong breezes SW. with a heavy swell. No observation. P.M. Wind South; came to in 7½ fathoms. On the 18th fine weather.

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*Abstract of the log of H. C. Steamer "Ganges," Capt. Dicey, from Calcutta to Moulmein, under sail. Civil time.*

12th November 1839.—From midnight to 4 A.M. moderate breezes and hazy weather, wind EbN. At 8 increasing with a confused sea on. Noon, fresh breeze EbN. Latitude observed 18° 09' N., long. 88° 33' E. P. M. Strong increasing breezes, and dark gloomy weather with increasing sea; wind ENE. At 4 P.M. dark and threatening till midnight.

13th November.—Wind EbN. till 10 A.M. Squally and dark gloomy

\* Captain Shreeve informs me that at this time he considers Vizagapatam to have been bearing NW. 70 miles from him. The gale did not extend as far North as Ganjam, nor South to Masulipatam.



weather, appearance of a gale. Hard and increasing gale; made all snug, vessel labouring much. 10 A.M. wind ENE. till noon, when hard ENE. gale with very high sea. No observation. Latitude by account  $16^{\circ} 21' N.$  longitude account  $88^{\circ} 51' E.$  P.M. Hard gales ENE. dark gloomy weather. 6 P.M. Barometer 29.00. At 8 *weather apparently moderating*. Midnight, strong gales with a high sea. Bar. 29.0.

14th November.—Strong gale at ENE. dark gloomy weather, with a very high sea striking the paddle box, cabins, and sponsons with tremendous violence. At 4 A.M. the same, with heavy rain. At 6 wind east, high sea running. At 7 wind ESE. At 8 put on steam, full power, but could not obtain steerage way, wind EbS. Noon, fresh breezes, with very heavy sea running, drizzling rain, ship labouring much. No observation. Lat. account  $15^{\circ} 37' N.$  long. account  $88^{\circ} 38' E.$  Barometer 29.20. 1 P.M. wind  $SE\frac{1}{2}S.$  Weather apparently clearing, made some sail. 7 P.M. squally with rain. 8, strong increasing gales and dark cloudy weather. Midnight the same.

15th November.—SE. wind, hard gales, lightning to the northward, and SE. occasionally. Daylight, strong gales and dark gloomy weather. At 8 A.M. decreasing gale and cloudy, but a high sea on. Noon, more moderate. Latitude by observation  $16^{\circ} 17' N.$  longitude by Chron.  $89^{\circ} 40' E.$  Barometer 29.20. 1 P. M. wind SE. as before, decreasing breezes and cloudy. 4, fresh breezes with dark gloomy weather, passing squalls, rain, and a heavy sea. At 8, the same. At midnight stiff breeze, with alternately clear and cloudy weather. Barometer 29.30.

16th November.—Wind SE. fresh breezes and cloudy. At 2 A.M. light breezes. 5 A.M. Wind SEbE. At daylight fresh gales. At 8, Barometer 29.50. Decreasing strong breeze, with a high sea. At 10, weather clearing up. At noon, moderate and clear. Lat. by observation  $18^{\circ} 16' N.$  longitude  $90^{\circ} 55' E.$  At P.M. wind EbS. moderate and fine till midnight.

Captain Dicey remarks, that “before the gale came on with him, the weather appeared threatening, with a cloudy and gloomy sky, the Barometer fell very suddenly to  $29^{\circ}$ , and during the breeze the wind was from SSE. to the NE. *After the first blow, it broke a little*, and I put on the steam, and managed to make a little easting, and although it came on again, it was with less violence,; after which I found as I progressed to the eastward, the gale became less violent,

and had a very heavy confused sea, with hard gusts of wind at intervals, and I think we experienced this storm with less violence than other vessels further to the westward."

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*Capt. West, H. C. Steamer "Enterprise," informs me as follows.—*

We had no bad weather, to speak of, across the Bay from Akyab; but whilst there, on the 13th, 14th, and 15th, of last month, the weather was rather threatening from the eastward. The "Amherst" left Akyab on the 15th, and I understand they had a fresh breeze across from ESE. We left Akyab on the 16th, and experienced a heavy swell from SW. to SSW. and as we got over to the westward it was rather squally, but not of the least consequence. The swell continued till we got well up the Eastern Channel, but we had no wind. We arrived at Calcutta on the 18th November.

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*Extract from the log of the "Helen," Captain Henderson.*

13th November, 1839.—Moderate breezes from NE. to ENE. throughout the 24 hours, all sail set by the wind. Latitude at noon  $19^{\circ} 00' N.$ , longitude  $88^{\circ} 30' E.$

14th November.—The first 12 hours squally, with rain from NE. and eastward. Latter part steady breezes from the ENE. Latitude noon  $20^{\circ} 10' N.$ , longitude  $88^{\circ} 35' E.$

15th November.—Moderate breezes from the eastward, with cloudy weather. At daylight passed close under the Floating Light Vessel's stern and hailed her, but could not get a pilot (none being on board her). At 4 P.M. were advised by one of the Pilot brigs to stand to sea, the weather having a very threatening appearance, and the wind increasing fast. At 6 P.M. put the ship under double reefed topsails and foresail, down royal yards, &c. Fresh gales, with strong squalls. Sun obscured.

16th November.—Ditto weather with rain. At 6 A.M. wore ship and stood to the NNE. wind East. At 4 P.M. sighted a Pilot brig, which signalized to us to stand to sea; fresh gales with heavy squalls. The Pilot brig off the Eastern Sea-Reef was at anchor on the tail.

17th November.—The first part of these 24 hours, fresh gales with hard squalls. Latter part, moderate winds from SEbE. and clear weather, latitude  $20^{\circ} 22' N.$ , longitude  $87^{\circ} 25' E.$

*Extract from the log of the H. C. S. "Amherst," 13th to 17th  
November, 1839.*

*13th November.*—At anchor in Akyab harbour. At midnight, wind moderate at north, and threatening appearance.

*14th November.*—Wind N., NNE., NNW., NW., NE., and at midnight North; moderate, and light threatening appearance at daylight. At noon clearing, but dark to the westward. Bar. at noon 29.90. At midnight, moderate, but inclined to be squally and a threatening appearance.

*15th November.*—North to NNW. and NE. At noon, moderate  
8 A.M. Bar. 29.94 and light air, but threatening appearance. Noon,  
Noon 93 looking better; weighed, and crossed the bar.  
4 P.M. 80 Bar. fell to 29.80; heavy swell from South; at  
8 — 84 8, moderate Northerly wind, and cloudy. Mid-  
Midnight 86 night fresh breezes, and cloudy, heavy swell  
from SSW.

*16th November.*—To daylight wind North to NNE. fresh breezes,  
4 A.M. Bar. 29.86 cloudy, and squally; threatening appearance to  
8 — 89 the W. Daylight, strong breeze and rain, and  
Noon 91 wind NE.; very threatening appearance to ESE.  
4 — 86 Noon, wind east, moderate; lumbering swell  
8 — 90 from ESE. and a cross swell all ways. Lat. D.R.  
Midnight 88 20° 48' N., lon. Chr. 90° 13' E. P.M., Wind east,  
threatening to SE. and swell from SSE. but in-  
clined to clear. 8 P.M. Lat. by ( 21° 12' N., at  
9 P.M. 12 fathoms water. Midnight moderate and  
cloudy, threatening to Southwest-ward. 11 fa-  
thoms water.

*17th November.*—Moderate but squally, threatening to SE. and SW.  
4 A.M. Bar. 29.82 sea moderate, wind east. 1 A.M. Floating Light's  
8 — 86 signal WbN.  $\frac{1}{2}$  N.  
Noon 90

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*Extract of a letter from Dr. Cumberland, Civil Station, Pooree.*

The gale which prevailed on the Madras Coast in the middle of November, did not extend to Pooree. On the 10th November we had light winds from the north, and in the afternoon SE. with cloudy

weather. On the 11th, moderate breezes from NE. and cloudy weather. 12th, NE. to E. cloudy. 13th, NE. fine weather and fresh breeze. 14th, NE. Moderate breeze, and fine weather. 15th, NE. to ENE. strong breeze, cloudy with rain (nine-tenths of an inch,). 16th, NE to ENE. strong breeze. At 5 P.M. squall from ESE. and a little rain (one-tenth). 17th, ESE. rather cloudy. At 4 P.M. SSE. then E. to NE. At 5 P.M. ESE. light winds.

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Captain Elson, Master Attendant at Chittagong, in forwarding the following register kept by Lieut. Young, Indian Navy, H. C. Surveying Brig "Hattrass" says.—

We had no gale here, (at Chittagong) but about the 14th, 15th, and 16th November, we had very cloudy weather, with slight rain, the wind variable from NNE. to SE. but nothing approaching to a gale, although there was a heavy sea outside.



Date.	Hour.	Place at Noon.	Barometer.	Thermometers.			Winds.	Remarks.
				Att.	Det.	W. Bulb.		
13th	6	.....	29.98	76 $\frac{1}{2}$	78	76 $\frac{1}{2}$	North.....	Moderate breeze and cloudy weather.
	10	.....	30.01	76 $\frac{1}{2}$	78	76 $\frac{1}{2}$	NE.....	Moderate breeze and cloudy weather.
	12	Lat. 21° 26'	29.97	76 $\frac{1}{2}$	78 $\frac{1}{2}$	76 $\frac{1}{2}$	NE.....	Moderate breeze and cloudy.
	4	Long. 90° 47'	29.92	76 $\frac{1}{2}$	78 $\frac{1}{2}$	77	North.....	Light breeze and cloudy.
	8	.....	29.95	78	80	78	North.....	Light breeze and cloudy.
14th	6	.....	29.95	78	80	78	NE.....	Moderate breeze and cloudy weather.
	10	.....	29.96	78	80	78	NbE.....	Mdt. breeze cloudy with heavy swell from Southward.
	12	Lat. 21° 20'	29.93	78 $\frac{1}{2}$	80 $\frac{1}{2}$	78	NbE.....	Moderate breeze and cloudy.
	4	Long. 90° 56'	29.88	78 $\frac{1}{2}$	80	78	NbE.....	Light breeze and cloudy—Do. swell.
	6	.....	29.88	78	80	76	ESE.....	Fresh breeze and dark cloudy weather.
Midnight,	8	.....	29.89	78	80	76	East.....	Fresh breeze Do. weather—heavy swell.
	.....	.....	.....	.....	.....	.....	ESE.....	Strong breeze at intervals with rain—Do. swell.
15th	6	.....	29.90	76 $\frac{1}{2}$	78	76 $\frac{1}{2}$	ENE.....	Fresh breeze and cloudy to S. Westward—heavy swell
	10	.....	29.90	76	78	74	NE.....	Fresh breeze and cloudy—rain at intervals.
	12	Lat. 21° 20'	29.90	76	78	74 $\frac{1}{2}$	NE.....	More moderate without rain—heavy swell.
	4	Long. 90° 56'	29.87	76	78	76	East.....	Light breeze and cloudy.
	6	.....	29.86	76	78	76	N. Easterly.	Light breeze and cloudy.
Midnight,	8	.....	29.86	76	78	76	N. Easterly.	Moderate and cloudy with rain,—Do. swell.
	.....	.....	.....	.....	.....	.....	N. Easterly.	Light airs—heavy swell,—Do. rain.

## Honorable Company's Surveying Brig "Hattrass."—(Continued.)

Date.	Hour.	Place at Noon.	Barometer.	Thermometers.			Wind.	Remarks.
				Att.	Det.	W. Bulb.		
16th	6	.....	29.89	76 $\frac{1}{2}$	78 $\frac{1}{2}$	76 $\frac{1}{2}$	NE.	Mdt. breeze, heavy SSE. Incred. swell—constant rain.
	10	.....	29.93	..	..	..	NE.	Light breeze and cloudy.
	12	Lat. 21.20 Long. 90.56	29.93	76 $\frac{1}{2}$	78 $\frac{1}{2}$	76 $\frac{1}{2}$	NE.	Light breeze and cloudy—Do. rain Do. swell.
	4 8	.....	29.85 29.90	76 $\frac{1}{2}$ ..	78 $\frac{1}{2}$ ..	76 $\frac{1}{2}$ ..	NE. NE.	Moderate breeze and cloudy. Light breeze and cloudy—Do. swell.
17th	6	.....	29.94	..	..	..	NEbN	Light breeze and cloudy; heavy swell.
	10	.....	29.97	78 $\frac{1}{2}$	80 $\frac{1}{2}$	78	NEbN	Light airs—fine weather,—Do. swell.
	12	Lat. 21.20 Long. 90.56	29.92	79	81	79	NE.	Light airs and fine—Do. swell.
	4 6 8	.....	29.88 29.88 29.92	80 80 ..	82 82 ..	80 80 ..	SE. ESE. ESE.	Light airs and fine,—Do. swell. Light airs and calms,—Do. swell. Light airs and fine,—Do. swell.
18th	6	.....	29.93	78 $\frac{1}{2}$	80 $\frac{1}{2}$	78 $\frac{1}{2}$	NE.	Light airs, fine clear weather.
	10	.....	29.97	80	82	80	ENE.	Light breeze and fine weather.
	12	Lat. 21.28 Long. ....	29.93	80	82	80	ENE.	Light breeze, fine weather; swell from South.
	4 8 Midnight.	.....	29.87 29.91 .....	80 80 .....	82 82 .....	80 80 .....	Variable. SSE. SSE.	Light airs and calms. Light airs; clear weather; heavy. Dew—Swell subsiding.

*At Balasore on the 13th November, Captain Bond's report to Government, says—*

13th—Ther. 79 Bar. 30.03\* wind N. With heavy rain.  
 14th—Ditto 79 ditto 28.84 (?) NW. to NE. a strong breeze.  
 15th—Ditto 80 ditto 28.82 NE. rain and puffy wind.  
 16th—Ditto 77½ ditto 28.84 NW. to SE., decreasing wind.  
 17th—Ditto 78 ditto 28.82 NE. to NW. strong breeze with rain.  
 18th—Ditto 80 ditto 29.00 SE. to NW. clearing up for fair weather.  
 N.B.—Wind stronger to the southward of the hills south of Choramoon, also more rain to the southward than to the northward. On this coast no craft lost, but to the southward, at Choramoon, salt was hove overboard from two vessels, which ran into that river for safety.

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*Extract from the log of the Ship " Maidstone," Captain Wimble.*

*Thursday, 14th November, 1839. A. M.*—Squally, thick, unsettled weather. Noon, steady breezes from the north-eastward, and cloudy. At 3 P. M. sounded in corrected 29.956 43 fathoms. At 6h. 30m. saw the Light Vessel, bearing WNW. At 9h. 30m. came to in eight fathoms, veered to 40 fathoms of cable. Light bearing SE. Midnight, light winds and fine weather.

*Friday, 15th. A. M.*—Moderate breezes and cloudy. At 8, breeze increasing. At 11, strong breezes and cloudy, veered to 60 fathoms. Noon, more moderate. At 4, strong breezes and dark cloudy weather, the Barometer falling, made Bar. Corrected. 4 P. M. 29.75 all snug, veered cable to 80 fathoms. At 8, 8 29.77 strong breezes and cloudy weather. Midnight 12 29.69 strong breezes and squally, with a heavy swell from the south-eastward, wind E.

*Saturday, 16th A. M.*—Strong breezes and cloudy weather, wind 4 A. M. 29.75 EbN. At 4, ditto weather, with a heavy swell 8 29.80 from SE. Daylight, squally with heavy rain. Noon 29.85 Noon, strong breezes, with heavy squalls and 4 29.85 rain. At 4, ditto weather. At 8, strong breezes 8 29.85 with constant heavy rain. Midnight, ditto weather, with a heavy swell from the SE. Midnight 29.95

\* This should probably be 29° 30' or 29° 03'

*Saturday, 17th A. M.*—Strong breezes from EbS. cloudy with rain.

At 8, more moderate, with light rain. Noon,

6 A.M. Br. 29.95 fresh breezes from ESE. and cloudy weather.

Noon 29.90 P. M. Strong breezes and squally, with rain: At

Midnight 29.95 8, more moderate and fine. Midnight, fresh breezes and cloudy weather:

N. B. Captain Wimble having favoured me with the height of his Barometer, at noon, at Calcutta, I have been able to compare it with that of the Surveyor General's Office. I have corrected his for the small amount of error—05 which it had. It may be mentioned here, that this is the only instance in which out of thirty or forty requests during these researches, I have been enabled to obtain this very simple, but important datum!

I now place the extracts from the logs of the Honorable Company's Pilot Vessels and Floating Lights, in the form of Tables from the 14th to the 18th November, and these are followed by the valuable Barometrical observations of Mr. Hudson, of the Honorable Company's Floating Light Vessel "*Hope*," and those of the Surveyor General's Office at Calcutta.



| Date,<br>Civiltime. | Names of Vessels. | Situation.                                                             | Winds, Weather, and Remarks.                                                                                                                                                                      |
|---------------------|-------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14th Nov.<br>1839.  | Beacon, F. L. V.  | Outer Station, ....<br>.. .. { <sup>21 04</sup><br>{ <sup>88 27</sup>  | On 13th Moderate and fresh NE. and NNE. breezes and fine. On this day the wind veering gradually to the East and SE. At midnight moderate E. to ESE. breezes, and unsettled appearance all round. |
|                     | Krishna, P. V...  | Mid-Channel, Reef Buoy WbN,<br>2 miles.                                | NEbN. breeze and fine. During the night strong Easterly breeze, and swell from the Southward.                                                                                                     |
|                     | Seahorse, P. V... | Cruizing. Floating Light from<br>WNW. to NE. ....                      | First part pleasant breezes North to NNE. latter fresh from ENE. to ESE.                                                                                                                          |
|                     | Jane, P. V. ....  | Cruizing. Floating Light Vessel<br>NNE to Ebs. .... ..                 | First and middle part pleasant breezes, NE. to ENE. latter variable and squally, with cloudy appearance to the North Eastward.                                                                    |
|                     | Hope, F. L. V. .. | At anchor, Inner Station .... { <sup>21 26</sup><br>{ <sup>88 07</sup> | To 4 P.M. Moderate Northerly breezes. 8 P.M. Light Easterly breeze.                                                                                                                               |

| Date,<br>Civil time. | Names of Vessels.      | Situation.                                                                        | Winds, Weather, and Remarks.                                                                                                                                                                                                                                                                                      |
|----------------------|------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15th Nov.<br>1839.   | Beacon, F. L. V. . . . | Outer Station, . . . .                                                            | Fresh E. to ENE. breezes increasing to noon, with rain and squalls. 4 p. m. strong ENE. breezes with squalls and threatening weather. At sunset the same, and heavy sea, N <sup>by</sup> E. The same at midnight, blowing hard from E. to ENE. and heavy squalls of wind and rain, riding with 140 fathoms cable. |
|                      | Krishna, P. V. . .     | Reef Buoy, WbN. 2' Mid-channel, ..                                                | Strong Easterly wind and cloudy threatening appearance.                                                                                                                                                                                                                                                           |
|                      | Seahorse, P. V. . .    | Cruizing. South Channel, . . . .                                                  | NE <sup>by</sup> E. wind. Very dirty appearance. Noon, increasing and threatening to Eastward. Made all snug.                                                                                                                                                                                                     |
|                      | Jane, P. V. . .        | Under weigh. S. Channel Buoy NNW.<br>at anchor S. Channel Buoy N <sup>by</sup> W. | First part variable winds ENE. to ESE. Midnight, breeze increasing; very threatening appearance to the Eastward. latter moderate gales ENE. to East. Threatening appearances all round. At anchor with 100 fathoms cable.                                                                                         |
|                      | Hope, F. L. V. . .     | At anchor, Inner Station, . . . .                                                 | To 4 p. m. moderate and strong ENE. breezes, cloudy and squally from E. to SW. with a heavy swell from Eastward. 8 p. m. Unsettled weather, NE. to ENE. at midnight.                                                                                                                                              |

| Date,<br>Civil time. | Names of Vessels.  | Situation.                                              | Winds, Weather, and Remarks.                                                                                                                                                                                                                                                                                                                   |
|----------------------|--------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16th Nov.<br>1839.   | Beacon F. L. V. .. | Outer Station, ....                                     | A.M. blowing hard from E. to ENE with heavy squalls of wind and rain, increasing at 4 A.M. from Eastward, and at daylight the same. Wind from E. to ENE. Noon the same, and cloudy to the SE. Sunset the same, with every appearance of a heavy gale. Midnight blowing very hard in heavy squalls of wind and rain, and threatening to the SE. |
|                      | Krishna, P. V. ..  | Mid-channel. Reef Buoy WbN. 2 miles,                    | Strong Easterly winds and cloudy, with rain.                                                                                                                                                                                                                                                                                                   |
|                      | Seahorse, P. V. .. | Cruizing between S. Channel and Point Palmiras, .. .... | Wind from E. to ESE. squally and rain. At noon at anchor on Point Palmiras, on account of the strong westerly set.                                                                                                                                                                                                                             |
|                      | Jane, P. V. ..     | At anchor, South Channel, ....                          | First part fresh gales from EbN. to EbS. or ESE., middle from East; latter hard squalls from ENE. to ESE. with heavy rain at intervals; riding with 170 fathoms. At 4 P.M. gale increasing after a squall from Eastward; telegraphing vessels to stand out to sea.                                                                             |
|                      | Hope, F. L. V. ..  | At anchor, Inner Station, ....                          | A.M. fresh ENE. breezes, squally and drizzly rain, and strong set from the Eastward. Noon, strong Easterly breezes, squalls, and heavy swell from Eastward. 8 P.M. NE. breezes decreasing fast. Midnight moderate Easterly winds and squally.                                                                                                  |

| Date,<br>Civil time. | Names of Vessels.   | Situation.                                                      | Winds, Weather, and Remarks.                                                                                                                                                                             |
|----------------------|---------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17th Nov.<br>1839.   | Beacon, F. L. V. .. | Outer Station, .. ..                                            | A.M. to Noon blowing fresh from E. to ENE. with heavy passing squalls and threatening to the SE. 4 P.M. to midnight, blowing fresh from E. to ESE. and SE. with heavy squalls and threatening to the SE. |
|                      | Krishna, P. V. ..   | Cruizing; and at anchor. Reef Buoy SWbW. F. L. SEbS.            | First and middle parts squally, with rain from East to SE. Latter light breezes East to SE. and cloudy.                                                                                                  |
|                      | Seahorse, P. V. ..  | Off Point Palmiras, Northern part.                              | Variable from NE. to SE. and blowing weather. Stood to the Southward during the night. At 9 A.M. on Point Palmiras in 19 fathoms. At 10 A.M. wind abating. 3 P.M. Wind SE. falling light.                |
|                      | Jane, P. V. ..      | At anchor South Channel. Latterly, F. L. V. SE $\frac{1}{2}$ E. | First part strong breezes EbN. to ESE. Middle very squally; latter moderate breezes from ESF. with occasional squalls, and very threatening appearances to the Eastward. 1 P.M. Wind ESE.                |
|                      | Hope, F. L. V. ..   | At anchor, Inner Station, ..                                    | Moderate Easterly breezes from EbS. to ENE. dark, gloomy and squally, with frequent showers of rain. Noon as before. 4 P.M. Moderating. 8 P.M. Moderate NE. Midnight. Ditto Easterly.                    |



| Date,<br>Civil time. | Names of Vessels.  | Situations.                                                  | Winds, Weather, and Remarks.                                                                                                                                                                |
|----------------------|--------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18th Nov.<br>1839.   |                    |                                                              |                                                                                                                                                                                             |
|                      | Beacon, F. L. V.   | Outer Station, . . . .                                       | .. A.M. to noon moderate E. to ESE. and S. with passing squalls and unsettled appearances. Daylight, wind SE. 4 P.M. full midnight SE. to S. and heavy appearances to SE. On the 19th fine. |
|                      | Jane, P. V         | Under weigh. F. L. V. about SSE.                             | .. Throughout the day squalls, with copious rain from E to S. and SSW.                                                                                                                      |
|                      | Hope, F. L. V. ..  | At anchor, Inner Station, ..                                 | .. Moderate NE. breeze and cloudy, 12h. 30m. squally. Wind veered to South. 1h. 30m. heavy squalls from SW. 2 P.M. wind veered to Eastward.                                                 |
|                      | Seahorse, P. V. .. | South Channel, ..                                            | .. Light breezes ESE. to SE. and SbE. with squalls and rain in first part.                                                                                                                  |
|                      | Krishna, P. V. ..  | At anchor F. L. SE $\frac{1}{2}$ E. Reef Buoy<br>SWbW. .. .. | First part light Easterly winds, middle SE. winds and rainy. At 12h. 30m. P.M. the wind suddenly shifted to the Eastward. Latter part light SSE. wind.                                      |

*Barometrical Observations, Honorable Company's Floating Light Vessel "Hope," Captain Hudson, Lat. 21° 26', Long. 88° 17'.*

| Date.     | Time.  | Bar.  | Ther. |                                        |
|-----------|--------|-------|-------|----------------------------------------|
| 14th Nov. | 8 A.M. | 29.95 | 72    | Moderate NE. hazy.                     |
|           | Noon,  | 96    | 76    | Ditto Northerly, ditto.                |
|           | 8 P.M. | 95    | 80    | Light breeze from Eastward.            |
| 15th Nov. | 8 A.M. | 29.91 | 75    | Moderate ENE. squally to Southward.    |
|           | Noon,  | 92    | 76    | Strong ENE. cloudy.                    |
|           | 4 P.M. | 86    | 76    | Ditto ditto ditto.                     |
|           | 8 P.M. | 92    | 76    | Moderate NE. and squally.              |
| 16th Nov. | 8 A.M. | 29.90 | 75    | First ENE. and squally.                |
|           | Noon,  | 92    | 77    | Strong Easterly breezes and unsettled. |
|           | 8 P.M. | 92    | 78    | N. Easterly winds decreasing fast.     |
| 17th Nov. | 8 A.M. | 29.94 | 77    | { Moderate Easterly winds, gloomy, and |
|           | Noon,  | 95    | 78    | } squally weather.                     |
|           | 4 P.M. | 88    | 77    | Ditto ditto, thick gloomy weather.     |
|           | 8 P.M. | 92    | 77    | Ditto ditto ditto.                     |
| 18th Nov. | 8 A.M. | 29.94 | 77    | Moderate Easterly, and cloudy weather. |
|           | Noon,  | 98    | 79    | Ditto ditto ditto.                     |
|           |        | 92    | 78    | Light Southerly breezes, cloudy.       |

*Meteorological Register kept at the Surveyor General's Office, Calcutta, 1839.*

| Nov. | Bar. Noon. | Ther. |              |                         |
|------|------------|-------|--------------|-------------------------|
| 12   | 29.994     | 81.0  | N. . . . .   | Cloudy, faint Sunshine, |
| 13   | 30.018     | 84.5  | N. . . . .   | Clear,                  |
| 14   | 29.970     | 84.0  | N. . . . .   | Partial Haze,           |
| 15   | .952       | 86.0  | E. . . . .   | Cumuli and Haze,        |
| 16   | .972       | 81.0  | EbS. . . . . | Cloudy,                 |
| 17   | .976       | 82.1  | S. . . . .   | Cloudy,                 |

For more convenient reference, and as marking some striking contrasts, I have collected the whole of the foregoing logs and reports, with the exception of that from the Baramahl Survey, into the following tabular views, which comprise the winds and weather, &c. at each position, at Noon, Civil time, of the day to which they refer.

| Date,<br>Civil time.        | Names of Vessels<br>and places.        | Wind and Weather,                                  | Lat. N.      | Long E.      | Bar.  | Simp. | Ther. | Remarks.                                                                |
|-----------------------------|----------------------------------------|----------------------------------------------------|--------------|--------------|-------|-------|-------|-------------------------------------------------------------------------|
| Noon<br>12th, Nov.<br>1839. | Brig Arethusa, ....                    | Strong increasing<br>breezes ENE.<br>squally, .... | ° '<br>16 34 | ° '<br>84 20 | ..    | ..    | ..    | { 8 a. m. appearance of a gale. In-<br>creasing since noon of 11th Nov. |
|                             | Balguerie, Fr. ....                    | W. to NW. heavy<br>squalls and rain, ..            | 11 36        | 90 20        | 28.95 | ..    | ..    | { Constant rain, squalls from<br>NNW. at times.                         |
|                             | Duke of Bedford,                       | SE. Fine, ....                                     | 11 41        | 91 21        | 30.0  | ..    | 82    |                                                                         |
|                             | Cashmere Merchant,                     | Lt. breezes increasing<br>from NE to ESE           | 16 58        | 92 25        |       |       |       |                                                                         |
|                             | Sumatra, ....                          | ENE. Fresh breeze,                                 | 15 29        | 91 02        |       |       |       |                                                                         |
|                             | At Vizagapatam,                        | NE. Fresh NE.<br>Monsoon, .. ....                  |              |              |       |       |       |                                                                         |
|                             | Ganges, (H. C.<br>Steamer,) ....       | EBN. Fresh breeze,                                 | 18 09        | 88 33        | ..    | ..    | ..    | { Increasing P. M. and till midnight<br>ENE. dark gloomy weather.       |
|                             | At Pooree, or Jug-<br>gurnath, .. .... | NE. to E. cloudy, ..                               | 19 48        | 85 45        | ..    |       | 81    |                                                                         |
|                             | AT CALCUTTA, ....                      | N. Cloudy, faint sun-<br>shine, .. ....            | 22 34        | 88 22        | 29.99 |       |       |                                                                         |

| Date,<br>Civil time.        | Names of Vessels and Places. | Winds and Weather.                                        | Lat. N.   | Lon. E.   | Bar.  | Simp. | Ther. | Remarks.                                                                                                                                                                 |
|-----------------------------|------------------------------|-----------------------------------------------------------|-----------|-----------|-------|-------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Noon,<br>13th Nov.<br>1839. |                              |                                                           |           |           |       |       |       |                                                                                                                                                                          |
|                             | Arethusa, ....               | N.E. fresh gale heavy squalls,                            | o ' 15 52 | o ' 85 18 |       |       |       | { 11 A.M. a heavy squall<br>laying the Brig on her beam-<br>ends for 15 or 20 minutes.<br>Every appearance of an ap-<br>proaching gale. Under double<br>reefed topsails. |
|                             | Fr. S. Balguetie, ....       | S.W. blowing strong, .. ....                              | 13 15     | 90 00     | 29.66 |       |       | Considerable sea rising.                                                                                                                                                 |
|                             | Duke of Bedford, .....       | SSE. to Ebs. squalls & rain,                              | 14 49     | 90 22     | 29.90 |       | 81    | { P.M. heavy squalls ESE. mid-<br>night Bar. 29.80.<br>Every appearance of a gale.<br>Hove to 4 P.M.                                                                     |
|                             | Rosalind, .. ..              | NNE. sqly. cloudy, strong gale                            |           |           |       |       |       | Preparing for bad weather.                                                                                                                                               |
|                             | Cashmere Merchant, ....      | East varying to ENE. ....                                 | No Obs.   | 85 05     |       |       |       | { Very high sea; all snug for a<br>gale. Bar. 29.0 at 6 P.M.                                                                                                             |
|                             | Ripley, ....                 | ENE. fresh gales, .. ..                                   | 15 22     | 90 42     |       |       |       | At anchor at Akyab.                                                                                                                                                      |
|                             | Fr.S. Sumatra, .. ..         | ENE. fresh Monsoon, .. ..                                 | 17 41     |           |       |       |       | All sail set.                                                                                                                                                            |
|                             | At Vizagapatam, ....         | ENE. hard gales, dark gloomy<br>weather. ....             | 16 21     | 88 51     |       |       |       | At anchor in Akyab.                                                                                                                                                      |
|                             | H. C. St. Ganges, .. ....    | Weather threatening from the<br>Eastward, .. ..           | 20 10     | 92 58     |       |       |       |                                                                                                                                                                          |
|                             | H. C. St. Enterprize, .. ..  | NE to ENE. moderate breezes,<br>North, threatening, .. .. | 20 10     | 88 30     |       |       |       |                                                                                                                                                                          |
|                             | Helen, ....                  | NE. fresh breeze and fine<br>weather. ....                | 19 48     | 85 45     |       |       |       | Surveying vessel.                                                                                                                                                        |
|                             | H. C. S. Amherst, .....      | NE. moderate and cloudy, ....                             | 21 26     | 90 47     | 29.97 |       | 78½   |                                                                                                                                                                          |
|                             | At Pooree, or Juggurnath,    | North, with heavy rain, ....                              | 21 28     | 87 10     | 30.63 |       | 79    |                                                                                                                                                                          |
|                             | At Balasore, .. ..           | NE. and NNE. breezes mo-<br>derate and fine, .. ..        | 21 04     | 88 27     |       |       |       | At anchor.                                                                                                                                                               |
|                             | Beacon, F. L. V. .. ....     | North, clear weather, .....                               | 22 31     | 88 22     | 30.02 |       | 81.5  |                                                                                                                                                                          |
|                             | At CALCUTTA, .....           |                                                           |           |           |       |       |       |                                                                                                                                                                          |

| Date,<br>Civil time.        | Names of Vessels<br>and Places. | Winds and Weather.                                                     | Lat. N.<br>° / | Lon. E.<br>° / | Bar.     | Simp. | Ther. | Remarks.                                                                          |
|-----------------------------|---------------------------------|------------------------------------------------------------------------|----------------|----------------|----------|-------|-------|-----------------------------------------------------------------------------------|
| Noon.<br>14th Nov.<br>1839. | Arethusa, ..                    | NE. Strong increasing gales with<br>frequent heavy squalls & rain, ... | 15 50          | 5 46           |          |       |       | Very high sea. Vessel labouring much.                                             |
|                             | Fr. S. Balquerie ..             | NE. with strong squalls: cloudy<br>and rain, ...                       | 16 20          | 88 54          | 29.64    |       |       | A heavy confused sea.<br>{ Prepared for bad weather. 4 P.M. Ba-<br>rometer 29.70. |
|                             | Duke of Bedford, ..             | Blowing in heavy gusts from East-<br>ward, ...                         | 17 35          | 90 20          | 29.80    |       |       | Tremendous cross sea—lying to.<br>No observation.                                 |
|                             | Rosalind, ..                    | About NNE. hard gales and stormy<br>weather, ...                       |                |                |          |       | 75    | { Under close reefed main-topsail. P. M.<br>{ veering to NNW. and NW.             |
|                             | Cashmere Merchant,              | ESE. increasing gales, ...                                             |                |                |          |       |       | { Squally appearance in the SE. with a<br>swell.                                  |
|                             | Ripley, ..                      | North. Heavy gale and squalls, ...                                     | 14 30          | 85 21          | 29.65    |       |       | Gale commenced at 10 P.M.                                                         |
|                             | Fr. S. Sumatra, ..              | ENE. increasing breeze with rain, ...                                  | 19 08          | 89 49          |          |       |       | { Weather apparently clearing. 1 P.M.<br>{ wind SE. to S. heavy sea.              |
|                             | Jane, ...                       | No report at Noon, ...                                                 | 17 10          | 89 20          |          |       |       | At Akyab.                                                                         |
|                             | At Vizagapatam, ..              | Fresh NE. monsoon, brassy sky, ...                                     | 17 42          | 83 26          | 29.20    |       |       | At Akyab.                                                                         |
|                             | H. C. St. Ganges, ..            | About SE. dark gloomy weather, ...                                     | 15 37          | 88 38          |          |       |       | { Appearances of a gale and heavy sea<br>outside.                                 |
|                             | Helen, ...                      | Threatening from Eastward, ...                                         | 20 10          | 92 58          |          |       |       | Veering to Eastward.                                                              |
|                             | H. C. S. Amherst, ...           | ENE. steady breezes, ...                                               | 20 10          | 88 35          |          |       |       | { At night strong Easterly breeze, swell<br>from Southward.                       |
|                             | At Pooree, ...                  | Light NNW. to NE. and threatening<br>to West, ...                      | 20 10          | 92 58          |          |       |       |                                                                                   |
|                             | At Chittagong, ...              | NE. Moderate and fine, ...                                             | 19 48          | 86 45          | 29.90    |       |       |                                                                                   |
|                             | H. C. Brig Hattrass,            | NNE. to SE. variable and cloudy, ...                                   | 22 20          | 91 51          |          |       |       |                                                                                   |
|                             | At Balasore, ...                | NbE. moderate and cloudy, ...                                          | 21 20          | 90 56          | 29.95    |       |       |                                                                                   |
|                             | Maidstone, ...                  | About North, strong breeze, ...                                        | 21 28          | 87 10          | 28.84(?) |       |       |                                                                                   |
|                             | Beacon, F. L. V. ...            | N.E. Steady breeze and cloudy, ...                                     |                |                | 29.96    |       |       |                                                                                   |
|                             |                                 | About NE. Unsettled appearance, ...                                    | 21 04          | 88 27          |          |       |       |                                                                                   |
|                             | Krishna, P. V. ...              | NbN. and fine, ...                                                     |                |                |          |       |       |                                                                                   |
|                             | Seahorse, P. V. ...             | About NNE. pleasant breezes, ...                                       |                |                |          |       |       |                                                                                   |
|                             | Hope, L. V. ...                 | Northerly breezes moderate, ...                                        | 21 26          | 88 07          | 29.96    |       |       |                                                                                   |
|                             | AT CALCUTTA, ...                | North. Partial haze, ...                                               | 22 34          | 88 22          | 29.97    |       | 84    |                                                                                   |



| Date,<br>Civil time.         | Names of Vessels<br>and Places.    | Winds and Weather.                                                                               | Lat. N.<br>° / | Lon. E.<br>° / | Bar.  | Simp. | Ther. | Remarks.                                                                                                                                                                                                                                                                                                                  |
|------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------|----------------|----------------|-------|-------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Noon.<br>15th, Nov.<br>1839. | Arethusa, ...                      | WNW. severe heavy gale, frequent squalls, ...                                                    | 14 00 (?)      | 86 06          |       |       |       | { 2 p.m. Hurricane WNW. At 4 p.m. ves-<br>{ sel on her broadside with wind at WSW                                                                                                                                                                                                                                         |
|                              | Fr. S. Balguerie, ...              | NE. to NNE. cloudy squally wea-<br>ther, ...                                                     | 17 56          | 87 50          | 29.74 |       | 80    | A good deal of sea.<br>{ Torrents of rain throughout, and vivid<br>{ lightning.<br>Strong gales, heavy squalls and rain.<br>{ Sprung mainmast. Tremendous sea<br>{ and vivid lightning. Wind veering all<br>{ round the compass.<br>{ Lying to under storm-trysail—sea<br>{ smoother—wind veering by 4 p.m. to<br>{ West. |
|                              | Duke of Bedford, ...               | East blowing hard—rain, ...                                                                      | 18 20          | 89 05          | 29.90 |       |       | Lying to.                                                                                                                                                                                                                                                                                                                 |
|                              | Cashmere Merchant, ...             | ESE. Strong gales, ...                                                                           | 17 33          |                |       |       |       | Appearances threatening.<br>In Vizagapatam roads.                                                                                                                                                                                                                                                                         |
|                              | Rosalind, ...                      | About SWbS. Hurricane and rain, ...                                                              |                |                |       |       |       | At Akyab.<br>Stood to sea from the Floating Light.<br>{ Leaving Akyab at Noon, heavy swell<br>{ from South.                                                                                                                                                                                                               |
|                              | Ripley, ...                        | NWbW. Hurricane. ...                                                                             | 13 55          | 85 58          | 29.25 |       | 73    |                                                                                                                                                                                                                                                                                                                           |
|                              | Fr. S. Sumatra, ...                | ENE. increasing gale, dark, rainy<br>weather, ...                                                | 18 57          | 89 34          |       |       |       |                                                                                                                                                                                                                                                                                                                           |
|                              | Jane, ...                          | East ? gale from the East, ...                                                                   | 17 42          | 83 26          |       |       |       |                                                                                                                                                                                                                                                                                                                           |
|                              | At Vizagapatam, ...                | NE. fresh monsoon, red brassy sky, ...                                                           | 17 42          | 83 26          |       |       |       |                                                                                                                                                                                                                                                                                                                           |
|                              | Indian Queen, ...                  | NE. Strong breezes and cloudy, ...                                                               | 16 17          | 89 40          | 29.20 |       |       |                                                                                                                                                                                                                                                                                                                           |
|                              | H. C. Sr. Ganges, ...              | SE. gale mod. dark cloudy weather,<br>threatening from Eastward, ...                             | 20 10          | 92 58          |       |       |       |                                                                                                                                                                                                                                                                                                                           |
|                              | Enterprise, ...                    | Easterly, threatening weather, ...                                                               |                |                |       |       |       |                                                                                                                                                                                                                                                                                                                           |
|                              | Ilclen, ...                        | NE. moderate and light airs but<br>threatening, ...                                              | 20 10          | 92 58          | 29.80 |       |       |                                                                                                                                                                                                                                                                                                                           |
|                              | H. C. S. Amherst, ...              | NbE. Strong breeze, cloudy and<br>rain, ...                                                      | 19 48          | 85 45          |       |       |       |                                                                                                                                                                                                                                                                                                                           |
|                              | At Pooree, ...                     | Variable NNE. to SE. cloudy, slight<br>rain, ...                                                 | 22 20          | 91 51          |       |       |       |                                                                                                                                                                                                                                                                                                                           |
|                              | At Chittagong, ...                 | NE. more moderate without rain, ...                                                              | 21 20          | 90 55          | 29.90 |       | 78    |                                                                                                                                                                                                                                                                                                                           |
|                              | H. C. S. Hattress, ...             | NE. rain and puffing wind, ...                                                                   | 21 28          | 87 10          | 28.82 |       | 80    |                                                                                                                                                                                                                                                                                                                           |
|                              | At Balasore, ...                   | ENE. Strong breeze and cloudy;<br>threatening, ...                                               |                |                | 29.96 |       |       | { At anchor near F. Light. Bar. falling.<br>{ Threatening weather.                                                                                                                                                                                                                                                        |
|                              | Maidstone, ...                     | ENE. Strong breeze squalls and<br>threatening, ...                                               | 21 00          | 88 23          |       |       |       | Heavy sea rising.<br>At anchor Reef Buoy WhN.                                                                                                                                                                                                                                                                             |
|                              | F. L. V. Beacon, ...               | Easterly breeze strong, threatening,<br>NbbE. (?) increasing and very dirty,<br>threatening, ... | 21 04          | 88 27          |       |       |       | Cruizing, South Channel.<br>At anchor, 100 fathoms cable out.<br>Heavy sea from Eastward.                                                                                                                                                                                                                                 |
|                              | Krishna P. V.<br>Seahorse P. V.    | ENE. moderate gale, threatening, ...                                                             | 21 26          | 88 07          | 29.92 |       | 76    |                                                                                                                                                                                                                                                                                                                           |
|                              | Jane P. V. ...                     | ENE. Strong breeze, threatening ...                                                              | 22 34          | 88 22          | 29.95 |       | 86    |                                                                                                                                                                                                                                                                                                                           |
|                              | Hope, F. L. V.<br>AT CALCUTTA, ... | East, cloudy and hazy, ...                                                                       |                |                |       |       |       |                                                                                                                                                                                                                                                                                                                           |



| Date,<br>Civil time.       | Names of Vessels and places.                    | Winds and Weather.                        | Lat. N.<br>° ' | Lon. E.<br>° ' | Bar.  | Simp. | Ther. | Remarks.                                                |
|----------------------------|-------------------------------------------------|-------------------------------------------|----------------|----------------|-------|-------|-------|---------------------------------------------------------|
| Nov.<br>17th Nov.<br>1839. | Arethusa, ....                                  | SE. fine breeze, .. ..                    | 17 33          | 86 05          |       |       |       | { A current of 50 to the North-<br>ward since the 14th. |
|                            | Duke of Bedford, .....                          | Easterly light breeze, .....              | 20 42          | 89 45          | 30.05 |       |       |                                                         |
|                            | Cashmere Merchant, ....                         | ESE. to SE, ....                          | 16 37          | 92 78          |       |       |       |                                                         |
|                            | Ripley, ....                                    | SE. settled fine, ....                    |                |                |       |       |       | Hurricane heavy; lasted to 4 A. M.                      |
|                            | Fr. S. Sumatra, ..                              | ESSE. moderating to fine weather, P. M.   | 19 30          | 89 30          |       |       |       |                                                         |
|                            | At Samulcotta, ..                               | Southward, moderating, ....               |                |                |       |       |       | Hurricane abating at 6 A. M.                            |
|                            | At Hope Island Lighthouse,<br>off Coringa, .... | Moderating.                               | 16 51          | 82 16          |       |       |       |                                                         |
|                            | At Vizagapatam, ..                              | South moderate, ..                        | 17 42          | 83 26          |       |       |       | At Anchor.                                              |
|                            | Indian Queen, ..                                | SW. strong breeze, ..                     | 20 22          | 87 25          |       |       | 81    |                                                         |
|                            | Helen, ..                                       | SESE. clear, ..                           | 19 48          | 85 45          |       |       | 78    |                                                         |
|                            | At Pooree, ....                                 | ENE. light winds, ....                    | 21 20          | 90 56          | 29.92 |       |       |                                                         |
|                            | H. C. S. Hattrass, .....                        | NE. Light winds and fine, ..              | 21 28          | 87 10          | 28.84 |       |       |                                                         |
|                            | At Balasore, ..                                 | NW. to SE. decreasing wind, ..            | 21 00          | 88 23          | 29.95 |       |       |                                                         |
|                            | Maidstone, ....                                 | ESE. fresh breeze, cloudy, ..             |                |                |       |       |       |                                                         |
|                            | F. L. V. Beacon, ....                           | East to ENE. passing heavy squalls, ..... | 21 04          | 88 27          |       |       |       | { Off Northern part Point Pal-<br>miras.                |
|                            | Krishna, P. V. ..                               | E. to SE. fresh breeze squally, ..        |                |                |       |       |       |                                                         |
|                            | Seahorse, P. V. ....                            | About ESE. abating. ....                  |                |                |       |       |       |                                                         |
|                            | Jane, P. V. ..                                  | ESE. squally, ....                        | 21 26          | 88 07          | 29.95 |       | 78    |                                                         |
|                            | Hope, F. L. V. ....                             | Easterly, gloomy, ....                    | 22 31          | 88 22          | 29.97 |       | 82    |                                                         |
|                            | At CALCUTTA, ..                                 | South, cloudy, ....                       |                |                |       |       |       |                                                         |

## HURRICANE OFF THE PREPARIS, 21st Nov. 1840.

A little hurricane experienced by the "Cashmere Merchant," between the Island of Preparis and Point Negrais, is one of singular interest, for it much reminds us of the smaller whirlwinds seen on shore in tropical countries. By projecting the vessel's track and drift, it appears that this vortex—and it clearly was one—could not at the most have exceeded sixty miles in breadth. Its centre must have passed very close to the ship. The direction in which it was travelling, also differs from that of the preceding storm, being about NbW., and in this it approximates to the September one. We have no farther notice of this storm from any quarter. I have marked it upon the chart, and the following is the extract from the "Cashmere Merchant's" log.

*Extract from the log book of the Bark "Cashmere Merchant," Capt. F. G. Warren; reduced to Civil time.*

On 20th Nov.—At 5 A. M. the Island of Preparis bore SE. about five or six miles distant. To noon calm. P. M. strong breezes and heavy squalls ENE. till midnight; standing to the NNW.  $30\frac{1}{2}$  miles, and to the NNE.  $14\frac{1}{2}$  miles till midnight.

21st November.—Midnight, strong gales EbN. with a heavy sea. Noon increasing to heavy gale at eastward, veering to north. 1 P. M. Wind North to NE. At 5, P. M. heavy gales. At 9 P. M. wind flew round to the westward, being about NW. with a complete hurricane, and cross-sea; vessel thrown on her beam-ends, all the canvas blown from the yards, five shrouds of the main, and three of the fore rigging being carried away, and water up to the hatches on deck; cut away top-gallant mast and yards, and sails from the yards to save the ship; sea making a clear breach over her. At midnight wind west; vessel lying on her broadside, working much, and making much water. At 5 P. M. the wind was WSW. having moderated from about 2 A. M. Noon, wind NE. bore away for Coringa being leaky, and too much damaged to reach Rangoon. Lat. by observation  $16^{\circ} 4' N$ .

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We have now to consider what is the amount of the knowledge to be deduced from these data,—how it agrees with the theory,—and how the evidence goes to prove the track which I have laid down for the Coringa storm. I may refer here to what I have said in the preceding memoir, p. 585, Journal of the Asiatic Society, for June 1839, on the

subject of the uncertainty which besets us, either from the state of the weather, or other causes, rendering it impossible to ascertain exactly the ship's position, or the true direction of the wind. I may add here, that we should further consider, that in a circle of 320 miles circumference, or about 100 in diameter, each point of the compass includes an area of ten miles, which may be considered as a trifling error in a vessel's reckoning in bad weather, so that if the wind be marked a point wrong, and the vessel's situation also be only ten miles wrong, *and both these errors the same way*, we may thus find a considerable discrepancy appearing where none really existed. I mention this for the information of those, who might perhaps look for more mathematical exactness than our data will allow, and because I am desirous of shewing how important correct observations are to us in tracing out, step by step, the truths or probabilities which we deduce from them.

It will be more convenient to consider this storm under the following heads.

I.—The formation of the vortex, or circle of the tempest, and evidence for its form.

II.—Its size.

III.—Its rate of progression.

I.—The formation of the vortex, or circle of the tempest, and evidence for its form.

We find that on the 12th at noon, (Diagram No. I.,) the Duke of Bedford, Balguerie, Sumatra, and Cashmere Merchant, were all on the eastern side of the Bay, between Lat.  $11^{\circ} 30'$  and  $17^{\circ} 00' N.$  and long.  $90^{\circ} 00' E.$  and  $92^{\circ} 30' E.$  Of these, we find the Sumatra with the wind at ESE., and the Balguerie with it at WNW. both with a strong breeze, and from this last being opposed to the usual monsoon current of that season (which is from the northeastward) we may suppose a vortex to be commencing. The monsoon seems to have been blowing steadily all across the bay, at least from the lat. of  $14^{\circ}$ , for we find on this day the Arethusa two degrees to the eastward of Coringa, and the Ganges Steamer in the middle of the Bay, in about  $18^{\circ} 30' N.$ , all with the winds between East and ENE. We may then conclude that the disturbing force, whatever this was, had only began to operate below the latitude of  $13^{\circ}$ , and near the Andaman Islands, and that its centre, deduced from the positions of the Balguerie and Sumatra, was about where I have placed



it for that day; in say  $13^{\circ} 30'$  N. and  $92^{\circ}$  E. The SE. wind experienced by the "Duke of Bedford" is scarcely an anomaly, because of her proximity to the Andaman Islands; the mountains of which, being some of them 2000 feet high, may have operated, as all high ranges of land seem to do, by deflecting the winds into a different course. I have therefore rejected her log for that day. The "Cashmere Merchant" seems also out of the influence of the vortex, and too near the coast of Tenassarim. The centre, if there was one, might have been further north or south, but I have preferred placing it nearly on a line with the general direction of the tempest on the following day. Could we have obtained from these ships a single observation when in Calcutta, so as to test the accuracy of their barometers by a standard, these observations would have been far more valuable; but as I have before observed p. 420, I could only obtain this in one instance out of about thirty applications made, while collecting information for the present memoir.

2. On the 13th we find the circle in some degree formed, for we have, as will be seen by the Diagram No. II, and tables

*Wind.*

The Ganges, . . . .	ENE.	..	Hard gale, high sea,
The Bedford, ...	ESE.	..	Heavy squalls and Bar. falling,
Balguerie, . . . . .	SW.	..	Blowing strong, sea rising,

and with their positions on the chart, this will give the centre of the vortex, if there was one, about where I have placed it, in lat.  $13^{\circ} 42'$  N. long.  $89^{\circ} 47'$  E.

The "Sumatra" seems to have run out of the influence of the vortex to the northward, and having no barometer, we cannot refer to its height. The storm can scarcely be said on this day to have reached the "Arethusa," "Ripley," and "Rosalind."

It is worth noticing, that the three ships first mentioned had all been running *towards* this point from noon of the 12th, and the changes of wind which they had since that date are exactly such as ought to occur if a vortex had been forming, moving onward in the direction laid down, and they had been running into it.

We have for the Barometers, that of—

The Ganges, . . . . 29.00 at 6 P.M. at which time she was about on the meridian of the centre.

The Bedford, .. 29.90, being 00.10 *higher* than on the 12th, the centre having passed her.

The Balguerie, . . . 29.66, being also 00.71 *higher*, than on the 12th.

We have unfortunately no comparisons in Calcutta for these Barometers; if we had so, they might have proved of great value. That of the "Ganges" was probably too low.

On the 14th, at noon, we have (Diagram, No. III.)

Ganges, wind about SE. clearing a little, heavy sea, Bar. 29.20.

Arethusa, NE. increasing strong gales and squalls.

Ripley, North, heavy gales, 29.65.

Rosalind, about NbE. hard gales and stormy.

The "Bedford" it is worth remarking, had her barometer again falling on this day, with very heavy weather from the eastward. The above winds, and positions of the ships, place the centre in about  $14^{\circ} 28' \text{ N.}$   $87^{\circ} 11' \text{ E.}$

On the 15th, at noon, we have (Diagram, No. IV) the "Arethusa" on her beam ends, in a hurricane which veered in 18 hours—or from 3 A. M. when it was at NE. to 9 P. M. when it was at SSW. and moderating—22 points; or about  $1\frac{1}{4}$  point in an hour. I presume that she must have been blown round the western side of the vortex, though so far clear of its centre, that the calm which is usually found when the ships cross the centre, and experience *sudden* shifts, did not occur with her. The "Ripley" we find also in pretty nearly a hurricane as to the force of the wind. Her barometer as low as 29.25 at noon, when we find the wind WNW. veering to WSW. by 6 P. M., or about four points in six hours, or at the rate of about  $\frac{3}{4}$  of a point in an hour; from which we should conclude, she was farther from the centre than the, "Arethusa." The "Rosalind" had a hurricane at from WbN. at 2 A. M. to SW. and SSW. at 1 P. M., or veering seven points in 11 hours, or also about  $\frac{3}{4}$  of a point in an hour; from which coincidence, and the direction of the wind, I have placed her on the same circle as the "Ripley," having most unfortunately no better datum to go by.

We have thus on this day, curiously enough, three ships blown each half or two-thirds round a circle! For the unprofessional reader should be told, that in weather such as is described in the vessels logs, of which I have always carefully preserved the expressions, a vessel does little more than drift bodily to leeward, as the wind veers with her.

It will be observed, as to the extent of the storm, that the "Ganges," and "Balguerie" had both the weather moderating, and were getting farther from the centre. The "Bedford" and "Cashmere Merchant," how-

ever, had still very heavy weather, but this was in the vicinity of the coast, and not *against* the usual direction of the monsoon at this period of the year; another instance in which, while a hurricane was fairly formed, and travelling across the Bay, the monsoon also rises to the strength of a heavy gale, as in the case of the hurricane of June, in my first memoir. To the eastward we find that the "Indian Queen" on this day was discharging cargo at Vizagapatam, and that the red appearance noted there, is the only indication of any change of weather, in the absence of the barometer.

On the 16th we find that the "Ripley," "Arethusa," and "Rosalind" had all fine weather, and again by noon they had borne up and made sail, so that the hurricane must have moved very rapidly past them, and have been of small extent. We have for this day's data the somewhat vague accounts from Vizagapatam, Coringa, and the Hope Island Lighthouse, but fortunately also the "Indian Queen's" log.

That of the "Jane" is very imperfect; the circle or its influence seems to have been just reaching Vizagapatam at noon; for we find that during the morning "it veered to the northward, and blew hard the whole day, *varying* from NE. to north, mostly north; the strength of the gale blowing about 10 A.M., and that in the evening the wind veered back to the eastward; blowing steadily all night from ENE. to east," showing that the centre of the vortex had passed somewhere to the south.

At Coringa itself we find some discrepancy in the simple report of the Collector, and that of the Lighthouse-keeper on Hope Island, which bears from the flag staff on Coringa, about EbS. distant five miles. This last report would place the centre to the north eastward at the beginning of it, and yet according to the latter part of it, and to the Collector's report, it must have passed to the southward. I suppose these anomalies in the direction of the wind, as well as any which may have occurred in the direction of the storm,—for I take the Lighthouse-keeper's report to be the correct one, as to the direction of the wind, which as a seaman he was most likely to estimate correctly—to have been owing either to irregularities which *do* occur near the centres, or to have been caused by the deflection of the first efforts of the wind against the chain of the Rajamundry hills, to the northward, and not far inland, against which, the direct line of the storm from seaward was impinging, and by the opening of the valley of the Godavery. From the log of the "Indian Queen," I have placed the centre at noon about where it is marked,

and I take it to have passed over the meridian of Coringa, to the southward, and at a very short distance, about midnight of the 16th and 17th, or early in the morning of the 17th. We have no farther news of it inland. Samulcottah, from which some reports are dated, is about fifteen miles north of Coringa, but within 7 or 8 of the coast. I wrote to the Collector of Coringa for further information as to the storm inland, but have no reply. By the Lighthouse-keeper's report, we find the rise of the river to have begun at 2 P.M. of the 16th. Now as this was owing to the damming up of its waters by those of the sea, and not to any inland fall of rain,—for the inundation was one of *salt* water, a wave, or rise, forced in over a low country—we may suppose this to have a little preceded the vortex, which thus becomes, as I have made it, one of about 150 miles in diameter. This agrees with the position of the “*Arethusa*,” which vessel we find at this time bearing up at 6 A.M. with fine weather, and the wind at SE. at noon, being out of the storm.

I trust that to those who will take the trouble to follow these observations, referring to the diagrams which are upon the same scale as the chart, will be satisfied that there is as good evidence as the nature of things will allow, for the track which I have assigned for this storm.

## II. *The size of the vortex.*

It will be seen by the chart and diagrams, that this is a remarkable instance of a storm *decreasing* in size as it progresses, but apparently *increasing* in violence. The diagram of the 13th, No. II, where we have the “*Ganges*” with a severe gale at ENE; the “*Balguerie*” with it at SW., and the “*Bedford*” at ESE.; all with their positions well ascertained, and including thus 22 points, or  $\frac{2}{3}$ ds of the compass, may be taken I think, as a fair instance of a circular storm, about 300 miles in diameter. That of the 16th where, though the hurricane—for it certainly *was* one there—had just left the “*Arethusa*,” “*Rosalind*” and “*Ripley*” a few hours, was but just touching Coringa, Vizagapatam, and Samulcottah, and had fairly begun with the “*Indian Queen*,” may be taken as proof that it had then contracted to about 150 miles, and was blowing with much greater violence. There is no instance in this hurricane of any vessel having been becalmed while the centre of the vortex was passing; so that we must either suppose that there was no calm at the centre, or that no vessel passed directly through it. This is a distinction worth being borne in mind for future guidance.



### III. *The rate of progression of the Storm.*

If our centres are correctly laid down, we find that the storm must have advanced from the 12th to the 13th about 150 miles,

13th	..	14th	..	159
14th	..	15th	..	62
15th	..	16th	..	160
16th	..	17th	..	123

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Total, .. .. . 654 miles in five days  
or 131 miles per day—or about  $5\frac{1}{2}$  miles per hour, on a line about N. 71 W. a rate which does not very greatly exceed that of the storm of June. The apparent check in the rate of motion between the 14th and 15th, if it really occurred, is curious. The centres on those days are tolerably well ascertained, and I should be inclined to suppose them, as correct as the others.

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I cannot close this second memoir, without repeating that from every officer connected with Government, and from most of the mercantile community, I have met with the most zealous assistance. The Marine Board, through their indefatigable secretary, Mr. Greenlaw, the Bankshall, through Captain Clapperton, and Captain Biden, Master Attendant at Madras,—to whose kind attentions I shall have particularly to refer in a future memoir,—have all vied with each other in forwarding the collection of materials for me; and indeed, though it is strange to say it, the only class of persons whose co-operation was especially necessary, and who were somewhat dilatory in according it, is that for whose especial use and benefit it is intended!—the commanders of ships! To this however there are, I am happy to say, some very honorable exceptions; and I trust that as the uses, objects, and success of our inquiries become more evident, we shall have less reason to complain on this score. The negligent commanders may reflect that there can be no harm done, in giving us the information; and to get safe off when others are dismasted, always reflects some credit; while, on the other hand, the most careful man may have his reputation and his prospects injured by a succession of misfortunes; against which the best safeguard is the knowledge we are trying to elicit.

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*Notes on the Wild Sheep of the Hindoo Koosh, and a species of  
Cicada. By Capt. HAY.*

$$\text{Genus Ovis. Incisors } \frac{0}{8} \text{ Molars } \frac{6.6}{6.6} = 32.$$

Adult male 3 feet 4 inches at shoulder. From nose to tail 5 feet 4 inches; head 1 foot; horns 2 feet 6 inches in length, tip generally broken, and 12 inches in circumference at the base, and turned spirally backwards and downwards, points afterwards incline forward.

A large beard from the cheeks and under jaw, divided into two lobes, neck ponderous, 14 inches long and 24 in circumference.

It has no mane above. General color pale rufous, inclining to grey, fading off to white beneath. Muzzle white; beard on either lobe white, connected to a streak of long black flowing hair reaching to the chest. Legs covered with white smooth short hair; belly white; tail small, short, and together with buttocks white.

Girth of body measured behind shoulders 4 feet.

Has a lachrymary sinus, very perceptible on dissection, there being a deep cavity in the bone under the eye.

The hair is particularly electric.

This differs from the *Ovis Tragelaphus* (of Dr. Smith), or bearded. Argali, in the following respects—

1st. In having a lachrymary sinus.

2d. In having no standing mane.

3d. In having no long hair on the knees.

4th. In colour of horns, which in the species inhabiting the mountains of Mauritania (Morocco) are black.

A variety of the *Ovis Tragelaphus*, inhabiting the mountains of Upper Egypt, is represented as wanting the mane on the shoulders, but is nevertheless said to have long tufts of hair round the fore knees, which differs from the species inhabiting the hills of the Hindoo Koosh range, and now under description.

They are gregarious in flocks of about 40, and are usually led by an old ram.

The female is inferior in size, and not so much of a rufous colour, and has small horns, inclining backwards and outwards about 6 inches in length. They produce their young in May and June. The lambs are the colour of the female, have a dark stripe down the back, and in front of the fore legs.

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On my march with the army of the Indus from Kandahar towards Cabool, I observed a remarkable congregation of the insects commonly known by the name of *Cicadæ*, or *Tettigoniæ*, (Fab.) which in no book on Entomology have I ever seen noticed. These insects, as far as I had hitherto observed in the Eastern Islands, where they are called *Trumpeters*, and in different parts of India, especially in the Himalaya about Simla, where their evening chirping must be familiar to all visitors, have never appeared to me in large societies, an individual person not being able to capture above a dozen of an evening. These likewise have always been confined to wooded countries, and the *Tettigonia* of Italy, and shores of the Mediterranean, the celebrated insect made sacred to Apollo, and mentioned by Virgil, *Cicada stridens*, is, I imagine, always found in thickly wooded countries.

In Afghanistan, where scarcely a tree is to be seen (generally speaking), I have been astonished at finding certainly not less than eight species of this insect; I believe them all to be new, because I have never before met with them, but I regret to say I have not a single book upon Entomology to refer to, and this note not being intended to identify species, but merely to show the very extraordinary numbers they were found in, I shall confine myself to the observations I made.

The first species of *Tettigonia* that attracted my notice was in the month of May at Kandahar, a very diminutive insect, which flew into our tents of an evening; this did not surprise me, because there are trees in the neighbourhood.

But at Jellowgheer, in the Turnuk valley, about fifty miles

from Kandahar, where not a tree is to be seen, or a shrub, excepting the jewassee, which grows in luxuriance, and a few tamarisk bushes, I discovered three larger species of *Tettigonia*, and fully as abundant as any flight of locusts I had ever seen. The prevailing colour was a deep orange, and the stems and branches of the tamarisk were covered with them, as hardly to be able to distinguish a particle of green, and their noise all day was unceasing. The jewassee bushes being at the same time covered with the empty scales of the pupæ, and shewing at once that these insects were bred on the spot: otherwise I should have conceived they were only migrating. Our tents and tent ropes, as soon as pitched, were covered by these insects, in fact every thing looked yellow. They continued in equal numbers for several days march through the Ghiljie country, and I saw in all eight or nine different species. One scarce variety I discovered with pink wings, and another, far less active in flight, appeared upon the ripe ears of corn, and immediately they were approached made a heavy flight for a yard or two and fell to the foot of the corn, not again lighting upon the heads. The wings of this last species have not the transparency that all the others, excepting the pink winged variety, possess.

Fortunate indeed is it that Providence has formed these insects to live by suction, or their damage to the crops if furnished with the jaws of a *Locust*, would be irreparable: their clinging propensities had, however, entirely deprived some branches of their shoots.

Now what appeared to me extraordinary was, that these insects should appear in this country, where there are apparently no birds or animals to feed upon them. Locusts where they appear in vast numbers, as in Africa, always have their destroyers following them: but here not a gryllivorous bird was to be seen, not even the *Vespertilionidæ* to disturb them at night. The only enemies they appeared to have, were some large *Libellulæ*, which pounced upon them, and carried off what appeared to be double their own weight.

The *Pupæ*\* at seasons must be very abundant, and might even in this country have afforded the Greeks food, as well as the *Pupæ* of the *Locusts*.

\* I believe I ought to have written *Larvæ* for *Pupæ*, as they only undergo a semi-metamorphosis.

R. G. H.

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*Note on the above.*

The readers of the Journal who would wish to compare the description of the wild sheep of the Parapomisan range with that of the Himalayas, will find Mr. Hodgson's full and accurate notice of the latter animal Vol. iv. Journal Asiatic Society, p. 492. Capt. Hay, in a letter to me, says, "The enclosed description of our wild sheep at Bameean differs I think from the species in the Himalaya. I have now three lambs in my room perfectly domesticated, but such places as they attempt to climb, show the nature of the mountains they inhabit; what think you of a couple of them setting to work to climb up my chimney, nearly perpendicular, but with projecting bricks here and there! I am anxious to observe their habits, and if any of my notes, &c. &c. &c."

Capt. Hay has in a part of his note on the Cicada alluded to the possibility of the species of insect which he found in such numbers, or their "*larvæ*" furnishing an article of food to the Greeks, in the same manner as the locust. Being curious to see whether any allusion is made by ancient writers to the locust, or Cicada, as an article of food in countries adjacent to Bactria, I referred to the ordinary and well known authorities for information. Pliny alone has, speaking of the locust, (Lib. xi. cap. 29.) "Tot orbis partibus vagatur id malum. *Parthis et hæc cibo gratæ.*" No mention is made of the insects in the accounts extant of Alexander's march (Arrian. Quint. Curt.), nor even in Strabo (Lib. xv.) for the ordinary use of the locust as an article of food with the Bœotians, v. Aristoph. Acharnes. Act. iv. scene 7.

(πότερον ἀκρίδες ἡδιόν ἐστιν, ἢ κίχλαι.)

The querist being informed, in reply to this, that "locusts are much better flavoured" (than thrushes) v. also scene 1 of the same act, where a Bœotian comes in selling them, calling them "the four winged." I did not like to publish the whole of Capt. Hay's note, without remarking on what might have appeared startling.



*Proceedings of the Asiatic Society.*

(Wednesday Evening, 15th July, 1840.)

The Honorable Sir E. RYAN, President, in the chair.

Read the Proceedings of the last Meeting.

Major R. J. H. BIRCH, and Captain BROOME, proposed at the last Meeting, were ballotted for, and duly elected Members of the Society.

A. CAMPBELL, Esq. Superintendent of Darjeeling, proposed by the Officiating Secretary, and seconded by Sir E. RYAN.

Rev. A. WALLIS, of Bishop's College, proposed by Sir E. RYAN, seconded by the Officiating Secretary.

Major POTTINGER, Bombay Artillery, proposed by Captain MACLEOD, seconded by the Officiating Secretary.

J. J. TORRENS, Esq. B. C. S. proposed by the Officiating Secretary, seconded by Captain MACLEOD.

Baboo RAMGOPAL GHOSE proposed by Dr. J. GRANT, seconded by Captain MACLEOD.

Dr. T. THOMSON, the Curator of the Society, proposed by the President, seconded by the Officiating Secretary.

Read letters from W. J. HAMILTON, Esq. Secretary to the Geological Society of London, and J. FORSHALL, Esq. Secretary to the British Museum, acknowledging receipts of the 2nd part of the 20th Volume of the Transactions of the Society.

Read a letter from Messrs. W. H. ALLEN and Co., Book Agents of the Society in London, intimating their having paid the arrears of subscription, 24*l.*, due by the Society to the Oriental Translation Fund up to the end of the past year.

*Library.*

The following books were presented :—

Journal of the Royal Asiatic Society of Great Britain and Ireland, London 1839, No. 10.—*by the Society.*

Oriental Christian Speetator, Bombay, May 1840, Vol. I, No. 5.

Letter to Major General JOHN BRIGGS, on the discovery of part of the second Volume of the Jami-al Tawareekh of Rasheed-ul-Deen, by W. MORLEY, Esq. —*by the author.*

Committee of Commerce and Agriculture of the Royal Asiatic Society of Great Britain and Ireland, London 1839,—*by the Committee.*

Sojutii Liber de Interpretibus Korani Arabicè editus et annotatione illustratus. Lugduni, Batavorum, 1839. 4to 1.

Lexicon Arab. et Lat. of Haji Khalfae, by Gustavus Fluegel, Leipzig, 1837. 2nd Volume.

Map of Hindustan in Nagree character.—*by the Honorable H. T. PRINSEP, Esq.*  
Cotton Trade of India ; its future prospects, part 2nd.

The following were received from the booksellers :—

Recherches sur les Poissons Fossiles par L. Agassiz, Neuchatel, with plates.



Histoire Naturelle des Poissons, par M. C. B. Cuvier—Tome, 4 1839.  
avec Planches,—2.

Journal des Savans, October, 1839.

Annals of Natural History, and Magazine of Geology, Botany, and Geology. London, 1838, Nos. 1 to 10.

*Literary and Antiquities.*

Read a letter from Mr. W. MORLEY, Barrister of Lincoln's Inn, forwarding a pamphlet on the Jami-al Tawareekh, a General History of Nations—which is to appear in the transactions of the Home Society. The discovery of portions of this curious work, the 1st Volume alone of which was hitherto supposed to be extant, is highly valuable; the first vol. is the history known as the TARREEKH-I-GHAZAN KHAN: the whole work consisted of 4 volumes, and was completed by its author, RUSHEED-OD-DEEN, about 709 Hej. The MSS. now discovered came originally from Lucknow, and was found by Mr. MORLEY, and subsequently other and later portions of it by Professor FORBES, in the Library of the Society in London. The portion of the manuscript that has as yet been found, commences with the eleventh race of the kings of Khutta, the previous part had not yet been traced, and unfortunately the date is not in consequence ascertainable, but the titles of the kings, "Rai Kugao," or "Kukao," seem to point them out as of that race with whom the numismatic discoveries in Afghanistan have made us acquainted; but the Officiating Secretary informed the Meeting that there was a chance of recovering the remaining portion from Lucknow, or from the Royal Library at Delhi, at one of which places he hoped traces of it might be found among the collection of other manuscripts. There was also a trace of the same work at Herat; and he had sent copies of Mr. MORLEY's pamphlet to several influential members of society in different parts of the country, in order to endeavour a partial recovery of the Manuscript.

N. B. Since the above announcement, nearly 100 abridged copies of the pamphlet, translated into Persian, have been circulated to every person, and place, by whom, or in which, traces might be found of this invaluable work. The Officiating Secretary has had late intelligence from Lieut. Conolly of the alleged existence of original MS. of so very ancient a date at Bokhara, that he almost dares to hope that some portion of the work may be discovered in that stronghold of Islam. Suggestions have been made on the mode of effecting this.

*Museum.*

A number of Coins from Ispahan were laid before the Meeting by the Officiating Secretary for their inspection; and were found to be not very ancient, but they were beautiful specimens.

*Physical.*

The Officiating Secretary next submitted the Report of the Curator upon the specimens of Natural History in the Museum—with a proposition to the Society to purchase the specimens of stuffed animals and birds which were still remaining of Captain HAY's collection at Messrs. Tulloh & Co's Auction Rooms. Captain HAY had written to the Society, wishing them to make an offer for the whole, as he was desirous of getting them off his hands. The Curator and Mons. BOUCHEZY had on this been to inspect the

specimens—many of which they found to be very valuable and in good preservation, but many had suffered from the neglected way in which they had been exposed in the Auction Room. Both gentlemen, however, strongly recommended the Society to make this addition to their Museum, if it could be done for 3000 or 3500 Rupees; the cost to Captain HAY, to make the collection, had been 26,000. Dr. GRANT thought it a great pity that Captain HAY had not come to some resolution of this nature before; he doubted not Captain HAY paid every farthing of the sum stated for the collection. Dr. G. was in Cape Town when he commenced it. When the expense for the transmission of such specimens to the Society was taken into the account, he thought the Society would do well to give the sum required, and place them in the Museum, for it would cost considerably more to get similar specimens of their own.

Sir E. RYAN, called the attention of the Meeting to the proceedings held regarding this collection on their first arrival in India, in 1838. A Committee was formed for the purpose of taking the subject into consideration; they highly approved of it, and an application was made to Government to furnish the Society with the means of purchasing the collection, but it was refused, on the ground, that specimens of birds, &c. were, of too perishable a nature for a climate like India, but that they may be offered to some Society at home.

Sir E. RYAN, did not think proper to purchase the collection by raising a subscription among the Members, as the object for which the Society was originally established was to obtain only Indian specimens, of which duplicates were to be sent to the Museum of the India House, and the purchase of foreign specimens merely for the purpose of comparison, could not well be done with any good results, unless there was a perfect Museum, and the funds of the Society could not raise it to that.

Dr. GRANT begged to recall what he had before said, as he was then unacquainted with the circumstance now mentioned, and to concur entirely with what had fallen from the President; but he would in addition beg to suggest to the influential members of native society, that they should step forward, and now that so good an opportunity offers, purchase the collection themselves, and have a Museum attached to one of their institutions, the Hindoo or Medical College, by which means, and a very little outlay, they would save to the country this valuable collection. Mr. E. Stirling proposed that an offer be made to Captain HAY to place the specimens in the Museum at the Society's expense till a purchaser be obtained. Sir E. RYAN said this offer had once been made to Captain HAY, but refused—he however had no objection for its being made again. The proposition was then put and carried *nem con*.

Read a letter from Captain HURTON, 37th N. I. dated Candahar 24th May, regarding his 1st part of a tour to the Spiti valley, which persons writing anonymously in the public prints had reflected upon in a manner to hurt the author's feelings.

Captain H. entered at some length into the subject, and expressed his desire to refund the advance made to him by the Society for the purpose of the tour, if doubts were entertained as to the mode of his having performed it, or as to the general originality of the information communicated. As no doubts were expressed, it was resolved to decline the offer of refund, and record the Society's sense of the value of the addition made to its Museum, in the Geological specimens procured by Captain HURTON, during the tour in question.

N. B. The 2nd, 3rd, and last parts of the tour have since been received.

*Erratum in the article on "Lightning Conductors," published in the last Journal.*

It gives me regret to have to point out a serious error in my account of the accident by lightning which occurred to Dr. Goodeve's house, in May, 1837. The distance of the part struck from Mr. Trower's conductor, is twenty-two *yards*, instead of twenty *feet*, as stated in my letter.

The error was occasioned by my entrusting the measurement to a native assistant, who no doubt either contented himself by a guess, or unknowingly used the word *feet* instead of *yards* in his report. Illness prevented my making the measurement myself. Fortunately, however, the error does not in the least degree vitiate the argument, in which the accident was mentioned for illustration's sake alone. That the best conductor will not protect a radius of 60 feet (as Biot has assumed it would) is now proved by the history of so many lightning explosions, that an error in one is of no importance whatever. The reader will find in paras. 10, 11, 12, 13, and 14, of my second report, sufficient facts to set this question at rest for ever.

My chief object in noticing the accident to Dr. Goodeve's house was to shew, that one and the same explosion may fall on a conductor and also on other adjacent bodies; that is, that one conductor may not be capable of carrying off the whole of the electricity of a single flash, although the conductor remain unmelted, or even be not perceptibly altered by the heat of the discharge. This view is but strengthened by the occurrence as it now stands in the corrected account. The greater the distance, the more remarkable is it that the primary flash should have been subdivided, as in this instance. Let it be remembered that Dr. Goodeve *saw* the flash strike both objects at the same instant.

I congratulate Mr. Daniell on the occasion thus afforded to him for a further display of the peculiar tone, and temper, which characterized his first report. But I repeat here distinctly, that the error into which I have been betrayed does not in the slightest degree affect the inferences which *all* the facts recorded manifestly lead to---1st, that a conductor, however well constructed does not infallibly protect a space of sixty feet radius,---2d, that a flash of lightning may strike a conductor, and other adjacent objects at the same instant. The occurrence at Dr. Goodeve's house has nothing to do with the discussion regarding the "*lateral discharge*;" and had the accident never taken place, the arguments I advance would not be in the least degree affected. One good result, at all events, will proceed from this mistake---that I shall never again depend on the measurements made by persons who do not understand the object in view, and the necessity for care in their performance of so simple a task.

W. B. O'SHAUGHNESSY.

Calcutta, 10th September, 1840.







